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# Abundance Analysis of the Silicon Star HR 6958

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A Full Line List in the Paper of HR 6958 (PASJ 55, 1133 (2003))

HR 6958 = HD 170973  AOSiCr,  CP2 star, Si stars

Teff : 10750.000
log g : 3.500
microturbulent velocity :  0.5 km/s

WV  : wave length in Angstrom
EP  : lower excitation potential in eV
log gf : logarithmic oscillator strength
EW  : equivalent width in milli Angstrom, "syn" means spectral synthesis method
Rem : remarks
Abund : abundance measured in log Abund(H) = 12.00

Table :  A list of lines

| SpeciesAtom | WV | EP | log gf | EW | Rem | Abund |
|---|---|---|---|---|---|---|
| He I | 2.00 3819.000 | 20.964 | -1.044 | syn | < | 9.99 |
| | 2.00 4026.198 | 20.964 | -0.700 | syn | < | 9.99 |
| | 2.00 6678.150 | 21.217 | 0.329 | syn | < | 9.99 |
| 3 | mean | | | | | <9.99 |
| C II | 6.01 4747.230 | 13.720 | -1.000 | 26 | | 8.60 |
| 1 | | | | | | 8.60 |
| O I | 8.00 6155.980 | 10.740 | -1.010 | 24 | | 9.09 |
| | 8.00 6156.811 | 10.740 | -0.690 | 43 | | 9.08 |
| 2 | | | | | | 9.09 |
| Na I | 11.00 5695.924 | 0.000 | -0.184 | 77 | | 7.23 |
| 1 | | | | | | 7.23 |
| Mg I | 12.00 5172.684 | 2.712 | -0.402 | syn | | 7.00 |
| 1 | | | | | | 7.00 |
| Mg II | 12.01 4384.637 | 9.995 | -0.790 | syn | | 6.97 |
| | 12.01 4390.572 | 9.999 | -0.530 | syn | | 6.97 |
| | 12.01 4433.940 | 9.999 | -0.910 | 42 | | 7.59 |
| | 12.01 4481.126 | 8.863 | 0.740 | syn | | 7.20 |
| | 12.01 4739.593 | 11.569 | -0.660 | syn | | 7.20 |
| 5 | | | | | | 7.30 |
| Al I | 13.00 3961.520 | 0.014 | -0.323 | syn | | 6.47 |
| 1 | | | | | | 6.47 |
| Al II | 13.01 5704.874 | 16.403 | 0.070 | syn | < | 7.46 |
| | 13.01 5769.137 | 16.403 | -0.020 | syn | < | 7.46 |
| | 13.01 5848.587 | 16.403 | -0.090 | syn | < | 8.46 |
| | 13.01 6226.195 | 13.020 | 0.050 | syn | < | 6.46 |
| | 13.01 6243.367 | 13.025 | 0.670 | 39:: | < | 7.17 |
| 5 | | | | | | <7.40 |
| Si II | 14.01 3853.665 | 6.857 | -1.517 | 130 | | 8.65 |
| | 14.01 3856.018 | 6.859 | -0.557 | 203 | | 8.52 |
| | 14.01 3862.595 | 6.857 | -0.817 | 182 | | 8.60 |
| | 14.01 4128.070 | | | syn | | 8.20 |
| | 14.01 4130.890 | | | syn | | 8.50 |
| | 14.01 4190.700 | 13.492 | 0.000 | 64 | | 8.66 |
| | 14.01 5041.024 | | | syn | | 8.50 |
| | 14.01 5055.984 | | | syn | | 8.30 |
| | 14.01 5701.410 | 14.174 | 0.300 | 32 | | 8.42 |
| 9 | | | | | | 8.53 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Si III | 14.02 | 4567.840 | 19.016 | -0.039 | 17 | 8.89 |
| | 14.02 | 4574.757 | 28.085 | -0.509 | syn | 9.00 |
| 2 | | | | | | 8.92 |
| P II | 15.01 | 4475.270 | 13.086 | 0.301 | syn | 6.44 |
| | 15.01 | 5425.880 | 10.802 | 0.241 | syn | 5.86 |
| | 15.01 | 6043.084 | 10.802 | 0.384 | syn | 5.44 |
| 3 | | | | | | 5.65 |
| S II | 16.01 | 4230.943 | | | syn | 7.33 |
| 1 | | | | | | 7.33 |
| Ca II | 20.01 | 3933.640 | 0.000 | 0.134 | syn | 6.66 |
| 1 | | | | | | 6.66 |
| Sc II | 21.01 | 4246.830 | 0.315 | 0.320 | 62 | 3.76 |
| | 21.01 | 5526.790 | 1.768 | 0.130 | 16 | 3.61 |
| 2 | | | | | | 3.69 |
| Ti II | 22.01 | 4163.640 | 2.590 | -0.400 | 130 | 7.56 |
| | 22.01 | 4263.260 | 5.569 | -1.018 | 51 | 7.78 |
| | 22.01 | 4277.560 | 4.968 | -0.825 | 67 | 7.68 |
| | 22.01 | 4287.890 | 1.080 | -2.020 | 91 | 7.47 |
| | 22.01 | 4301.300 | 4.950 | -1.387 | 54 | 7.89 |
| | 22.01 | 4301.940 | 1.161 | -1.160 | 117 | 7.23 |
| | 22.01 | 4316.810 | 2.048 | -1.420 | 73 | 6.88 |
| | 22.01 | 4367.660 | 2.590 | -1.270 | 107 | 7.88 |
| | 22.01 | 4394.060 | 1.221 | -1.590 | 94 | 7.14 |
| | 22.01 | 4398.290 | 1.224 | -2.388 | 59 | 6.99 |
| | 22.01 | 4399.780 | 1.237 | -1.270 | 108 | 7.16 |
| | 22.01 | 4407.710 | 1.221 | -2.470 | 84 | 7.75 |
| | 22.01 | 4408.790 | 5.692 | -0.896 | 55 | 7.81 |
| | 22.01 | 4411.080 | 3.095 | -1.060 | 86 | 7.44 |
| | 22.01 | 4411.940 | 1.224 | -2.406 | 66 | 7.20 |
| | 22.01 | 4412.310 | 5.663 | -0.989 | 30 | 7.29 |
| | 22.01 | 4417.710 | 1.165 | -1.430 | 109 | 7.36 |
| | 22.01 | 4421.940 | 2.061 | -1.770 | 69 | 7.11 |
| | 22.01 | 4441.740 | 1.180 | -2.410 | 73 | 7.37 |
| | 22.01 | 4443.810 | 1.080 | -0.700 | 134 | 7.12 |
| | 22.01 | 4464.450 | 1.161 | -2.080 | 102 | 7.86 |
| | 22.01 | 4468.500 | 1.130 | -0.600 | 147 | 7.22 |
| | 22.01 | 4470.860 | 1.165 | -2.280 | 82 | 7.50 |
| | 22.01 | 4488.330 | 3.123 | -0.820 | 98 | 7.55 |
| | 22.01 | 4500.380 | 1.084 | -3.093 | 56 | 7.55 |
| | 22.01 | 4518.360 | 1.080 | -2.555 | 60 | 7.10 |
| | 22.01 | 4563.750 | 1.221 | -0.960 | 130 | 7.35 |
| | 22.01 | 4600.240 | 1.243 | -3.615 | 31 | 7.57 |
| | 22.01 | 4609.300 | 1.180 | -3.260 | 47 | 7.55 |
| | 22.01 | 4655.800 | 1.161 | -3.014 | 41 | 7.15 |
| | 22.01 | 4710.780 | 4.009 | -2.420 | 20 | 7.61 |
| | 22.01 | 4719.530 | 1.243 | -3.220 | 35 | 7.27 |
| | 22.01 | 4763.890 | 1.221 | -2.447 | 65 | 7.16 |
| | 22.01 | 4792.440 | 1.237 | -3.328 | 41 | 7.51 |
| | 22.01 | 4805.110 | 2.061 | -1.100 | 114 | 7.56 |
| | 22.01 | 4806.360 | 1.084 | -3.761 | 35 | 7.71 |
| | 22.01 | 5069.100 | 3.123 | -1.390 | 62 | 7.09 |
| | 22.01 | 5211.550 | 2.590 | -1.356 | 70 | 6.96 |
| | 22.01 | 5252.010 | 2.590 | -2.502 | 58 | 7.80 |
| | 22.01 | 5336.780 | 1.582 | -1.700 | 103 | 7.60 |
| | 22.01 | 5381.030 | 1.566 | -2.080 | 84 | 7.47 |
| | 22.01 | 5418.760 | 1.582 | -1.999 | 68 | 6.99 |
| | 22.01 | 5490.700 | 1.566 | -2.650 | 50 | 7.19 |
| | 22.01 | 5973.080 | 8.082 | -0.337 | 28 | 7.93 |
| | 22.01 | 6005.240 | 8.133 | -0.202 | 24 | 7.71 |
| | 22.01 | 6005.830 | 8.089 | -0.217 | 21 | 7.62 |
| | 22.01 | 6007.140 | 8.071 | -0.553 | 22 | 7.97 |
| | 22.01 | 6029.300 | 8.097 | 0.670 | 57 | 7.63 |
| | 22.01 | 6041.080 | 8.133 | 0.288 | 38 | 7.58 |
| | 22.01 | 6046.529 | 8.097 | 0.126 | 34 | 7.63 |
| | 22.01 | 6059.180 | 8.093 | 0.143 | 25 | 7.38 |
| | 22.01 | 6068.740 | 8.114 | 0.558 | 45 | 7.49 |
| | 22.01 | 6073.760 | 8.098 | -0.139 | 24 | 7.64 |
| | 22.01 | 6076.310 | 8.116 | -0.037 | 24 | 7.53 |
| | 22.01 | 6079.850 | 8.114 | -0.009 | 33 | 7.76 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 22.01 | 6080.680 | 8.082 | 0.003 | 23 | 7.45 |
| | 22.01 | 6102.530 | 8.116 | 0.178 | 32 | 7.53 |
| | 22.01 | 6106.450 | 8.098 | 0.416 | 39 | 7.46 |
| | 22.01 | 6107.860 | 8.097 | -0.371 | 21 | 7.77 |
| | 22.01 | 6439.480 | 8.281 | -0.071 | 25 | 7.73 |
| | 22.01 | 6513.050 | 4.002 | -1.310 | 48 | 7.22 |
| | 22.01 | 6606.950 | 2.061 | -2.790 | 38 | 7.35 |
| 62 | | | | | | 7.46 |
| V II | 23.01 | 4005.706 | 1.817 | -0.460 | syn | 4.90 |
| | 23.01 | 4023.388 | 1.805 | -0.880 | syn | 5.10 |
| | 23.01 | 4035.627 | 1.793 | -0.960 | syn | 5.30 |
| 3 | | | | | | 5.10 |
| Cr I | 24.00 | 4274.810 | 0.000 | -0.231 | 38 | 7.25 |
| | 24.00 | 5204.506 | 0.941 | -0.208 | 47 | 7.92 |
| 2 | | | | | | 7.59 |
| Cr II | 24.01 | 4145.800 | 5.319 | -1.164 | 71 | 7.42 |
| | 24.01 | 4172.610 | 3.105 | -2.356 | 48 | 6.77 |
| | 24.01 | 4207.360 | 3.827 | -2.475 | 45 | 7.18 |
| | 24.01 | 4217.090 | 3.105 | -2.809 | 39 | 7.00 |
| | 24.01 | 4224.860 | 5.330 | -1.726 | 61 | 7.69 |
| | 24.01 | 4229.790 | 3.827 | -3.324 | 28 | 7.61 |
| | 24.01 | 4268.880 | 6.484 | -1.570 | 37 | 7.46 |
| | 24.01 | 4269.280 | 3.854 | -2.167 | 63 | 7.38 |
| | 24.01 | 4275.580 | 3.858 | -1.709 | 79 | 7.41 |
| | 24.01 | 4362.950 | 5.662 | -1.887 | 37 | 7.36 |
| | 24.01 | 4546.630 | 7.772 | -1.179 | 45 | 7.96 |
| | 24.01 | 4555.000 | 4.071 | -1.380 | 86 | 7.34 |
| | 24.01 | 4587.260 | 6.487 | -1.650 | 35 | 7.51 |
| | 24.01 | 4588.200 | 4.071 | -0.630 | 115 | 7.26 |
| | 24.01 | 4592.060 | 4.073 | -1.220 | 93 | 7.36 |
| | 24.01 | 4616.640 | 4.072 | -1.290 | 101 | 7.63 |
| | 24.01 | 4634.080 | 4.072 | -1.240 | 95 | 7.42 |
| | 24.01 | 4671.380 | 5.662 | -2.010 | 15 | 6.85 |
| | 24.01 | 4697.610 | 5.670 | -1.880 | 49 | 7.66 |
| | 24.01 | 4715.140 | 5.662 | -2.310 | 33 | 7.68 |
| | 24.01 | 4723.350 | 4.168 | -2.705 | 40 | 7.47 |
| | 24.01 | 4742.190 | 4.143 | -3.125 | 19 | 7.33 |
| | 24.01 | 4761.440 | 5.670 | -2.542 | 28 | 7.81 |
| | 24.01 | 4779.060 | 5.670 | -1.925 | 32 | 7.27 |
| | 24.01 | 4812.380 | 3.864 | -1.800 | 78 | 7.42 |
| | 24.01 | 4884.600 | 3.858 | -2.080 | 78 | 7.68 |
| | 24.01 | 4901.630 | 6.487 | -0.826 | 57 | 7.27 |
| | 24.01 | 4903.750 | 8.616 | -1.201 | 15 | 7.57 |
| | 24.01 | 4912.450 | 6.484 | -0.948 | 46 | 7.09 |
| | 24.01 | 5237.330 | 4.073 | -1.160 | 92 | 7.23 |
| | 24.01 | 5246.790 | 3.713 | -2.450 | 50 | 7.22 |
| | 24.01 | 5275.000 | 4.071 | -1.290 | 99 | 7.52 |
| | 24.01 | 5308.399 | 4.071 | -1.810 | 83 | 7.64 |
| | 24.01 | 5313.600 | 4.073 | -1.650 | 71 | 7.17 |
| | 24.01 | 5334.880 | 4.072 | -1.562 | 87 | 7.49 |
| | 24.01 | 5407.630 | 3.827 | -2.088 | 56 | 7.08 |
| | 24.01 | 5420.940 | 3.758 | -2.360 | 57 | 7.32 |
| | 24.01 | 5502.110 | 4.168 | -1.990 | 68 | 7.48 |
| | 24.01 | 5543.061 | 10.859 | 0.184 | 22 | 7.58 |
| | 24.01 | 5552.210 | 10.880 | 0.200 | 18 | 7.46 |
| | 24.01 | 5569.130 | 10.872 | 0.824 | 49 | 7.71 |
| | 24.01 | 5573.830 | 10.872 | 0.283 | 31 | 7.76 |
| | 24.01 | 5605.030 | 10.880 | 0.072 | 24 | 7.79 |
| | 24.01 | 5671.630 | 3.827 | -3.445 | 35 | 7.90 |
| | 24.01 | 5775.810 | 7.386 | -1.819 | 22 | 7.85 |
| | 24.01 | 5820.060 | 6.487 | -2.273 | 9 | 7.32 |
| | 24.01 | 5827.260 | 6.605 | -2.042 | 29 | 7.86 |
| | 24.01 | 6027.030 | 6.577 | -2.286 | 17 | 7.73 |
| | 24.01 | 6089.640 | 6.487 | -1.265 | 37 | 7.25 |
| | 24.01 | 6112.240 | 4.745 | -2.943 | 20 | 7.53 |
| | 24.01 | 6138.750 | 6.484 | -1.967 | 30 | 7.79 |
| | 24.01 | 6147.130 | 4.756 | -2.843 | 18 | 7.37 |
| | 24.01 | 6208.150 | 4.760 | -2.984 | 23 | 7.67 |
| | 24.01 | 6226.630 | 4.756 | -2.981 | 22 | 7.65 |
| | 24.01 | 6271.890 | 6.641 | -2.065 | 27 | 7.89 |
| | 24.01 | 6585.300 | 11.264 | 0.829 | 33 | 7.62 |
| 56 | | | | | | 7.48 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mn II | 25.01 | 4283.769 | 5.373 | -2.204 | 20 | 7.00 |
| | 25.01 | 4478.660 | 6.645 | -0.950 | 25 | 6.54 |
| | 25.01 | 4518.930 | 6.645 | -1.329 | 12 | 6.46 |
| | 25.01 | 4730.380 | 5.373 | -2.147 | 14 | 6.74 |
| | 25.01 | 4755.700 | 5.397 | -1.242 | 42 | 6.64 |
| | 25.01 | 4806.830 | 5.417 | -1.559 | 21 | 6.42 |
| | 25.01 | 4811.540 | 5.417 | -2.342 | 9 | 6.72 |
| | 25.01 | 5559.029 | 6.184 | -1.318 | 14 | 6.37 |
| | 25.01 | 6122.380 | 10.183 | 0.950 | 31 | 6.74 |
| | 25.01 | 6125.880 | 10.184 | 0.783 | 21 | 6.59 |
| 9 | | | | | | 6.62 |
| Fe I | 26.00 | 4143.880 | 1.557 | -0.450 | 55 | 8.72 |
| | 26.00 | 4153.850 | 3.396 | -0.270 | 42 | 9.12 |
| | 26.00 | 4156.810 | 2.832 | -0.620 | 24 | 8.72 |
| | 26.00 | 4181.760 | 2.832 | -0.180 | 36 | 8.59 |
| | 26.00 | 4202.000 | 1.485 | -0.708 | 59 | 9.04 |
| | 26.00 | 4235.940 | 2.425 | -0.341 | 54 | 9.00 |
| | 26.00 | 4260.500 | 2.399 | -0.020 | 72 | 9.28 |
| | 26.00 | 4271.150 | 2.449 | -0.349 | 50 | 8.92 |
| | 26.00 | 4299.260 | 2.425 | -0.430 | 62 | 9.36 |
| | 26.00 | 4383.560 | 1.485 | 0.200 | 80 | 8.80 |
| | 26.00 | 4415.130 | 1.608 | -0.615 | 43 | 8.54 |
| | 26.00 | 4611.260 | 3.654 | -0.670 | 16 | 8.94 |
| | 26.00 | 4886.330 | 4.154 | -0.556 | 23 | 9.30 |
| | 26.00 | 4938.810 | 2.875 | -1.173 | 11 | 8.83 |
| | 26.00 | 4966.100 | 3.332 | -0.890 | 14 | 8.92 |
| | 26.00 | 4982.510 | 4.103 | 0.144 | 25 | 8.62 |
| | 26.00 | 4983.210 | 4.154 | -0.158 | 22 | 8.88 |
| | 26.00 | 4983.880 | 4.103 | -0.068 | 18 | 8.65 |
| | 26.00 | 5005.710 | 3.883 | -0.180 | 29 | 8.94 |
| | 26.00 | 5006.130 | 2.832 | -0.767 | 21 | 8.75 |
| | 26.00 | 5014.960 | 3.943 | -0.250 | 23 | 8.89 |
| | 26.00 | 5074.780 | 4.220 | -0.200 | 26 | 9.07 |
| | 26.00 | 5162.310 | 4.178 | 0.020 | 33 | 9.01 |
| | 26.00 | 5229.850 | 3.283 | -1.127 | 10 | 8.94 |
| | 26.00 | 5269.540 | 0.859 | -1.321 | 41 | 8.74 |
| | 26.00 | 5364.880 | 4.446 | 0.220 | 23 | 8.67 |
| | 26.00 | 5367.500 | 4.415 | 0.350 | 44 | 9.10 |
| | 26.00 | 5400.450 | 4.371 | -0.160 | 26 | 9.12 |
| | 26.00 | 5410.910 | 4.473 | 0.280 | 28 | 8.78 |
| | 26.00 | 5603.000 | 3.430 | -0.907 | 22 | 9.26 |
| | 26.00 | 5615.650 | 3.332 | -0.140 | 46 | 9.07 |
| | 26.00 | 5662.510 | 4.178 | -0.541 | 12 | 8.93 |
| | 26.00 | 5762.950 | 4.209 | -0.450 | 17 | 9.05 |
| | 26.00 | 5984.760 | 4.733 | -0.343 | 18 | 9.25 |
| | 26.00 | 6020.180 | 4.607 | -0.270 | 14 | 9.00 |
| 35 | | | | | | 8.94 |
| Fe II | 26.01 | 4182.690 | 4.732 | -3.663 | 17 | 8.52 |
| | 26.01 | 4184.880 | 11.167 | -0.929 | 48 | 9.66 |
| | 26.01 | 4186.110 | 7.790 | -2.825 | 24 | 9.40 |
| | 26.01 | 4199.480 | 11.149 | -0.226 | 44 | 8.87 |
| | 26.01 | 4202.930 | 6.807 | -2.613 | 54 | 9.56 |
| | 26.01 | 4229.390 | 7.806 | -2.529 | 23 | 9.09 |
| | 26.01 | 4240.500 | 11.291 | -0.955 | 33 | 9.37 |
| | 26.01 | 4263.880 | 7.693 | -1.712 | 59 | 9.22 |
| | 26.01 | 4273.340 | 2.704 | -3.258 | 90 | 9.09 |
| | 26.01 | 4278.150 | 2.692 | -3.816 | 69 | 9.09 |
| | 26.01 | 4286.280 | 7.708 | -1.622 | 71 | 9.44 |
| | 26.01 | 4303.180 | 2.704 | -2.490 | 111 | 8.77 |
| | 26.01 | 4318.190 | 7.880 | -1.981 | 29 | 8.74 |
| | 26.01 | 4361.260 | 6.138 | -2.114 | 70 | 9.19 |
| | 26.01 | 4372.240 | 2.676 | -4.381 | 35 | 8.70 |
| | 26.01 | 4373.500 | 6.219 | -3.477 | 28 | 9.41 |
| | 26.01 | 4380.730 | 4.738 | -3.919 | 26 | 9.07 |
| | 26.01 | 4385.390 | 2.778 | -2.570 | 107 | 8.78 |
| | 26.01 | 4413.590 | 2.676 | -3.870 | 52 | 8.62 |
| | 26.01 | 4416.830 | 2.778 | -2.600 | 104 | 8.76 |
| | 26.01 | 4418.900 | 7.946 | -1.839 | 63 | 9.57 |
| | 26.01 | 4431.590 | 7.940 | -1.767 | 43 | 8.97 |
| | 26.01 | 4440.440 | 6.703 | -2.905 | 24 | 8.95 |
| | 26.01 | 4440.810 | 7.946 | -2.466 | 25 | 9.16 |
| | 26.01 | 4446.250 | 5.956 | -2.439 | 74 | 9.52 |

| | | | | | |
|---|---|---|---|---|---|
| 26.01 | 4448.500 | 11.149 | -0.595 | 41 | 9.24 |
| 26.01 | 4449.640 | 7.928 | -1.589 | 61 | 9.26 |
| 26.01 | 4451.550 | 6.138 | -1.844 | 75 | 9.05 |
| 26.01 | 4451.960 | 11.255 | -0.742 | 33 | 9.20 |
| 26.01 | 4453.240 | 7.684 | -2.162 | 51 | 9.44 |
| 26.01 | 4455.260 | 6.225 | -2.143 | 68 | 9.21 |
| 26.01 | 4455.830 | 4.615 | -4.119 | 28 | 9.26 |
| 26.01 | 4459.690 | 11.308 | -0.979 | 19 | 9.02 |
| 26.01 | 4467.930 | 7.940 | -2.327 | 28 | 9.11 |
| 26.01 | 4487.500 | 7.693 | -2.141 | 43 | 9.23 |
| 26.01 | 4489.180 | 2.828 | -2.970 | 112 | 9.36 |
| 26.01 | 4491.390 | 2.855 | -2.700 | 82 | 8.41 |
| 26.01 | 4499.700 | 7.693 | -1.865 | 49 | 9.12 |
| 26.01 | 4504.360 | 6.219 | -3.266 | 18 | 8.89 |
| 26.01 | 4510.460 | 6.222 | -2.925 | 14 | 8.43 |
| 26.01 | 4520.210 | 2.807 | -2.600 | 99 | 8.72 |
| 26.01 | 4541.080 | 7.684 | -2.484 | 35 | 9.35 |
| 26.01 | 4541.530 | 2.855 | -3.050 | 94 | 9.02 |
| 26.01 | 4547.260 | 9.439 | -1.781 | 22 | 9.10 |
| 26.01 | 4576.360 | 2.844 | -3.040 | 89 | 8.89 |
| 26.01 | 4591.000 | 7.845 | -2.248 | 41 | 9.35 |
| 26.01 | 4598.480 | 7.804 | -1.497 | 60 | 9.09 |
| 26.01 | 4610.590 | 5.570 | -3.545 | 47 | 9.68 |
| 26.01 | 4614.550 | 7.693 | -2.570 | 29 | 9.28 |
| 26.01 | 4635.310 | 5.956 | -1.650 | 83 | 8.96 |
| 26.01 | 4638.050 | 5.956 | -1.650 | 61 | 8.38 |
| 26.01 | 4640.810 | 7.708 | -1.880 | 68 | 9.64 |
| 26.01 | 4648.940 | 2.583 | -4.389 | 36 | 8.69 |
| 26.01 | 4652.200 | 7.880 | -2.174 | 33 | 9.10 |
| 26.01 | 4663.700 | 2.891 | -4.265 | 64 | 9.48 |
| 26.01 | 4666.750 | 2.828 | -3.330 | 79 | 8.94 |
| 26.01 | 4676.950 | 7.946 | -3.047 | 17 | 9.50 |
| 26.01 | 4702.550 | 7.693 | -2.790 | 23 | 9.34 |
| 26.01 | 4709.690 | 6.807 | -2.865 | 12 | 8.59 |
| 26.01 | 4720.150 | 3.197 | -4.750 | 20 | 8.94 |
| 26.01 | 4728.200 | 7.940 | -2.583 | 22 | 9.22 |
| 26.01 | 4731.480 | 2.891 | -3.360 | 92 | 9.29 |
| 26.01 | 4760.140 | 5.570 | -3.553 | 18 | 8.90 |
| 26.01 | 4810.750 | 5.569 | -3.227 | 25 | 8.79 |
| 26.01 | 4824.830 | 8.145 | -1.893 | 28 | 8.81 |
| 26.01 | 4826.690 | 10.288 | -0.442 | 44 | 8.85 |
| 26.01 | 4880.950 | 7.582 | -2.680 | 24 | 9.22 |
| 26.01 | 4892.290 | 6.703 | -2.974 | 21 | 8.97 |
| 26.01 | 4893.840 | 2.828 | -4.450 | 53 | 9.32 |
| 26.01 | 4906.860 | 10.288 | -1.544 | 22 | 9.32 |
| 26.01 | 4908.140 | 10.329 | -0.304 | 57 | 9.07 |
| 26.01 | 4937.090 | 10.307 | -0.998 | 28 | 8.96 |
| 26.01 | 4946.930 | 10.347 | -1.197 | 21 | 8.96 |
| 26.01 | 4948.090 | 10.307 | -0.324 | 58 | 9.12 |
| 26.01 | 4948.800 | 10.347 | -0.008 | 66 | 8.99 |
| 26.01 | 4954.000 | 5.570 | -2.757 | 40 | 8.73 |
| 26.01 | 4958.830 | 10.379 | -0.645 | 40 | 9.02 |
| 26.01 | 4969.380 | 10.360 | -0.767 | 39 | 9.10 |
| 26.01 | 4974.200 | 10.329 | -0.844 | 42 | 9.23 |
| 26.01 | 4975.260 | 9.099 | -1.588 | 22 | 8.81 |
| 26.01 | 4976.000 | 9.099 | -1.583 | 26 | 8.95 |
| 26.01 | 4977.030 | 10.360 | 0.041 | 72 | 9.07 |
| 26.01 | 4987.260 | 10.391 | -0.985 | 26 | 8.94 |
| 26.01 | 4993.380 | 2.807 | -3.650 | 60 | 8.71 |
| 26.01 | 5000.750 | 2.778 | -4.740 | 33 | 9.06 |
| 26.01 | 5004.190 | 10.272 | 0.497 | 100 | 9.05 |
| 26.01 | 5006.830 | 10.379 | -0.427 | 61 | 9.32 |
| 26.01 | 5018.450 | 2.891 | -1.220 | 213 | 8.56 |
| 26.01 | 5019.460 | 5.569 | -2.697 | 55 | 9.08 |
| 26.01 | 5021.590 | 10.288 | -0.300 | 64 | 9.21 |
| 26.01 | 5029.110 | 10.360 | -0.854 | 37 | 9.14 |
| 26.01 | 5031.940 | 10.413 | -0.783 | 53 | 9.51 |
| 26.01 | 5035.710 | 10.288 | 0.606 | 121 | 9.20 |
| 26.01 | 5045.130 | 10.307 | -0.134 | 77 | 9.31 |
| 26.01 | 5047.650 | 10.307 | -0.068 | 64 | 9.00 |
| 26.01 | 5060.260 | 10.447 | -0.525 | 53 | 9.29 |
| 26.01 | 5061.700 | 10.307 | 0.217 | 79 | 8.99 |
| 26.01 | 5062.940 | 10.307 | -0.932 | 26 | 8.87 |
| 26.01 | 5067.890 | 10.329 | -0.198 | 52 | 8.87 |
| 26.01 | 5080.250 | 10.413 | -1.101 | 18 | 8.80 |

| | | | | | |
|---|---|---|---|---|---|
| 26.01 | 5086.300 | 10.413 | -0.475 | 61 | 9.40 |
| 26.01 | 5094.900 | 10.467 | -0.561 | 38 | 8.93 |
| 26.01 | 5098.680 | 10.447 | -0.380 | 57 | 9.24 |
| 26.01 | 5106.130 | 10.329 | -0.276 | 68 | 9.29 |
| 26.01 | 5112.190 | 10.455 | -0.836 | 44 | 9.36 |
| 26.01 | 5112.960 | 10.391 | -0.499 | 69 | 9.59 |
| 26.01 | 5115.060 | 10.431 | -0.453 | 41 | 8.89 |
| 26.01 | 5117.060 | 10.431 | -0.126 | 76 | 9.35 |
| 26.01 | 5119.340 | 10.391 | -0.558 | 37 | 8.87 |
| 26.01 | 5120.340 | 2.828 | -4.214 | 47 | 8.93 |
| 26.01 | 5132.630 | 2.807 | -4.180 | 63 | 9.30 |
| 26.01 | 5143.880 | 10.447 | 0.102 | 57 | 8.76 |
| 26.01 | 5144.390 | 10.467 | 0.283 | 86 | 9.14 |
| 26.01 | 5169.040 | 2.891 | -0.870 | 205 | 8.17 |
| 26.01 | 5178.450 | 10.431 | -0.589 | 65 | 9.61 |
| 26.01 | 5199.150 | 10.379 | 0.101 | 87 | 9.30 |
| 26.01 | 5218.830 | 10.380 | -0.205 | 68 | 9.27 |
| 26.01 | 5222.340 | 10.519 | -0.326 | 44 | 8.93 |
| 26.01 | 5223.850 | 10.379 | -0.594 | 49 | 9.24 |
| 26.01 | 5224.390 | 10.413 | -0.572 | 47 | 9.18 |
| 26.01 | 5231.890 | 10.531 | -0.645 | 57 | 9.54 |
| 26.01 | 5236.590 | 10.455 | -0.698 | 50 | 9.42 |
| 26.01 | 5254.400 | 10.499 | -0.767 | 37 | 9.17 |
| 26.01 | 5254.940 | 3.230 | -3.227 | 72 | 8.83 |
| 26.01 | 5276.000 | 3.199 | -1.940 | 125 | 8.67 |
| 26.01 | 5278.189 | 8.248 | -1.558 | 56 | 9.34 |
| 26.01 | 5278.930 | 5.911 | -2.408 | 47 | 8.78 |
| 26.01 | 5291.680 | 10.480 | 0.575 | 89 | 8.92 |
| 26.01 | 5303.390 | 8.184 | -1.612 | 40 | 8.95 |
| 26.01 | 5313.110 | 10.519 | -0.643 | 44 | 9.26 |
| 26.01 | 5325.561 | 3.221 | -2.600 | 94 | 8.76 |
| 26.01 | 5344.140 | 10.531 | -0.683 | 35 | 9.07 |
| 26.01 | 5349.190 | 10.561 | -1.193 | 18 | 9.02 |
| 26.01 | 5351.960 | 10.499 | -0.848 | 32 | 9.12 |
| 26.01 | 5355.440 | 10.499 | -0.412 | 40 | 8.90 |
| 26.01 | 5360.500 | 10.544 | -0.597 | 48 | 9.30 |
| 26.01 | 5366.210 | 10.503 | -0.270 | 59 | 9.24 |
| 26.01 | 5387.080 | 10.521 | 0.518 | 85 | 8.98 |
| 26.01 | 5388.040 | 10.451 | -0.725 | 35 | 9.07 |
| 26.01 | 5389.000 | 10.600 | -1.148 | 22 | 9.13 |
| 26.01 | 5398.960 | 10.561 | -0.814 | 15 | 8.55 |
| 26.01 | 5399.560 | 10.522 | -0.851 | 32 | 9.12 |
| 26.01 | 5402.890 | 10.560 | -0.667 | 35 | 9.07 |
| 26.01 | 5411.380 | 10.600 | -0.435 | 54 | 9.36 |
| 26.01 | 5411.960 | 10.560 | -1.070 | 21 | 9.04 |
| 26.01 | 5427.800 | 6.724 | -1.664 | 84 | 9.47 |
| 26.01 | 5444.380 | 10.600 | -0.185 | 76 | 9.56 |
| 26.01 | 5445.800 | 10.544 | -0.106 | 76 | 9.42 |
| 26.01 | 5450.110 | 10.623 | -0.530 | 67 | 9.75 |
| 26.01 | 5451.300 | 10.499 | -0.806 | 46 | 9.48 |
| 26.01 | 5457.710 | 10.629 | -0.168 | 61 | 9.24 |
| 26.01 | 5475.830 | 10.499 | -0.176 | 57 | 9.11 |
| 26.01 | 5479.400 | 10.560 | -0.415 | 57 | 9.39 |
| 26.01 | 5482.310 | 10.561 | 0.432 | 85 | 9.08 |
| 26.01 | 5488.780 | 10.596 | -0.466 | 46 | 9.19 |
| 26.01 | 5493.830 | 10.499 | 0.211 | 76 | 9.09 |
| 26.01 | 5501.060 | 10.600 | -0.823 | 47 | 9.57 |
| 26.01 | 5502.740 | 10.561 | -0.137 | 80 | 9.54 |
| 26.01 | 5503.880 | 10.522 | -0.645 | 48 | 9.40 |
| 26.01 | 5506.200 | 10.521 | 0.950 | 122 | 9.04 |
| 26.01 | 5529.060 | 10.522 | -0.250 | 59 | 9.26 |
| 26.01 | 5532.110 | 10.522 | -0.327 | 71 | 9.58 |
| 26.01 | 5532.940 | 6.730 | -2.780 | 44 | 9.55 |
| 26.01 | 5544.760 | 10.521 | 0.117 | 76 | 9.16 |
| 26.01 | 5549.010 | 10.522 | -0.230 | 70 | 9.47 |
| 26.01 | 5554.900 | 10.623 | -0.640 | 53 | 9.56 |
| 26.01 | 5558.280 | 10.544 | -0.567 | 42 | 9.17 |
| 26.01 | 5559.830 | 10.623 | -0.900 | 31 | 9.23 |
| 26.01 | 5563.390 | 10.629 | -0.573 | 44 | 9.26 |
| 26.01 | 5567.840 | 6.730 | -1.887 | 61 | 9.10 |
| 26.01 | 5571.550 | 10.596 | -1.052 | 23 | 9.11 |
| 26.01 | 5575.050 | 10.629 | -0.887 | 28 | 9.12 |
| 26.01 | 5579.931 | 10.629 | -0.551 | 48 | 9.37 |
| 26.01 | 5581.650 | 10.600 | -0.481 | 63 | 9.60 |
| 26.01 | 5591.391 | 3.267 | -4.685 | 33 | 9.29 |

| | | | | | |
|---|---|---|---|---|---|
| 26.01 | 5602.110 | 10.600 | -1.294 | 18 | 9.18 |
| 26.01 | 5629.880 | 10.561 | -1.027 | 22 | 9.05 |
| 26.01 | 5637.340 | 7.706 | -2.693 | 29 | 9.52 |
| 26.01 | 5643.850 | 7.653 | -1.458 | 59 | 9.06 |
| 26.01 | 5646.210 | 10.623 | -0.728 | 39 | 9.28 |
| 26.01 | 5648.880 | 10.561 | -0.242 | 69 | 9.47 |
| 26.01 | 5668.630 | 10.629 | -0.711 | 44 | 9.42 |
| 26.01 | 5673.130 | 6.807 | -3.003 | 36 | 9.59 |
| 26.01 | 5676.260 | 5.289 | -3.633 | 35 | 9.39 |
| 26.01 | 5679.090 | 10.861 | -0.877 | 17 | 8.85 |
| 26.01 | 5691.010 | 10.678 | -0.195 | 45 | 8.99 |
| 26.01 | 5694.400 | 10.678 | -1.259 | 19 | 9.26 |
| 26.01 | 5695.330 | 10.714 | -1.303 | 11 | 8.93 |
| 26.01 | 5707.149 | 7.790 | -2.589 | 17 | 9.09 |
| 26.01 | 5708.440 | 11.049 | -1.461 | 19 | 9.63 |
| 26.01 | 5714.950 | 10.857 | -0.675 | 19 | 8.76 |
| 26.01 | 5725.940 | 3.424 | -4.831 | 15 | 9.00 |
| 26.01 | 5726.560 | 10.714 | -0.016 | 61 | 9.19 |
| 26.01 | 5732.710 | 3.387 | -4.667 | 24 | 9.12 |
| 26.01 | 5750.880 | 7.806 | -2.598 | 14 | 9.00 |
| 26.01 | 5751.529 | 10.629 | -0.796 | 39 | 9.39 |
| 26.01 | 5754.700 | 11.050 | -1.438 | 13 | 9.38 |
| 26.01 | 5755.450 | 10.737 | -0.453 | 40 | 9.15 |
| 26.01 | 5762.410 | 7.790 | -2.610 | 19 | 9.19 |
| 26.01 | 5766.900 | 10.750 | -0.819 | 27 | 9.12 |
| 26.01 | 5768.450 | 10.853 | -0.505 | 20 | 8.64 |
| 26.01 | 5783.640 | 10.714 | 0.206 | 77 | 9.29 |
| 26.01 | 5795.880 | 7.274 | -2.163 | 38 | 9.06 |
| 26.01 | 5804.460 | 10.629 | -0.987 | 25 | 9.18 |
| 26.01 | 5804.880 | 5.570 | -3.726 | 18 | 9.14 |
| 26.01 | 5813.050 | 6.208 | -3.025 | 34 | 9.25 |
| 26.01 | 5823.189 | 5.569 | -3.070 | 47 | 9.32 |
| 26.01 | 5829.140 | 5.569 | -3.446 | 23 | 9.02 |
| 26.01 | 5832.440 | 6.807 | -3.136 | 10 | 8.81 |
| 26.01 | 5839.000 | 10.845 | -0.351 | 38 | 9.06 |
| 26.01 | 5842.300 | 10.737 | -0.213 | 58 | 9.34 |
| 26.01 | 5871.760 | 10.829 | 0.017 | 53 | 9.07 |
| 26.01 | 5926.360 | 7.684 | -2.587 | 42 | 9.81 |
| 26.01 | 5963.900 | 10.678 | -0.862 | 29 | 9.24 |
| 26.01 | 5981.760 | 7.868 | -2.145 | 24 | 8.94 |
| 26.01 | 6017.900 | 7.845 | -1.948 | 34 | 9.04 |
| 26.01 | 6018.880 | 10.829 | -1.096 | 12 | 8.91 |
| 26.01 | 6019.550 | 10.714 | -1.019 | 20 | 9.12 |
| 26.01 | 6084.130 | 3.199 | -3.808 | 48 | 8.80 |
| 26.01 | 6086.830 | 10.737 | -0.983 | 20 | 9.12 |
| 26.01 | 6088.330 | 7.868 | -2.138 | 22 | 8.89 |
| 26.01 | 6103.530 | 6.217 | -2.171 | 47 | 8.79 |
| 26.01 | 6116.030 | 3.230 | -4.691 | 17 | 8.84 |
| 26.01 | 6117.310 | 10.737 | -1.194 | 13 | 9.01 |
| 26.01 | 6124.130 | 11.208 | -0.752 | 24 | 9.26 |
| 26.01 | 6129.680 | 3.199 | -4.655 | 29 | 9.16 |
| 26.01 | 6149.260 | 3.889 | -2.724 | 101 | 9.36 |
| 26.01 | 6152.610 | 10.987 | -0.996 | 27 | 9.50 |
| 26.01 | 6163.609 | 6.219 | -3.166 | 16 | 8.87 |
| 26.01 | 6183.891 | 7.845 | -2.340 | 28 | 9.27 |
| 26.01 | 6199.150 | 5.569 | -3.191 | 35 | 9.15 |
| 26.01 | 6222.580 | 7.708 | -2.387 | 20 | 9.01 |
| 26.01 | 6224.610 | 10.909 | -0.648 | 28 | 9.16 |
| 26.01 | 6229.340 | 2.828 | -4.824 | 13 | 8.63 |
| 26.01 | 6241.360 | 11.288 | -1.017 | 23 | 9.53 |
| 26.01 | 6270.000 | 3.245 | -4.625 | 30 | 9.18 |
| 26.01 | 6271.140 | 11.255 | -1.013 | 24 | 9.56 |
| 26.01 | 6331.939 | 6.217 | -1.977 | 53 | 8.79 |
| 26.01 | 6338.150 | 4.768 | -4.178 | 11 | 8.90 |
| 26.01 | 6340.880 | 10.987 | -0.429 | 24 | 8.86 |
| 26.01 | 6364.080 | 11.049 | -0.578 | 19 | 8.86 |
| 26.01 | 6369.480 | 2.891 | -4.253 | 59 | 9.36 |
| 26.01 | 6375.800 | 10.934 | -0.085 | 64 | 9.53 |
| 26.01 | 6377.700 | 10.909 | -0.722 | 28 | 9.24 |
| 26.01 | 6386.680 | 6.803 | -2.461 | 37 | 9.15 |
| 26.01 | 6407.230 | 3.889 | -3.699 | 47 | 9.08 |
| 26.01 | 6414.290 | 11.049 | -0.767 | 39 | 9.72 |
| 26.01 | 6415.590 | 8.567 | -1.688 | 38 | 9.30 |
| 26.01 | 6442.960 | 5.549 | -2.885 | 57 | 9.47 |
| 26.01 | 6446.400 | 6.222 | -2.073 | 48 | 8.75 |

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      26.01 6451.050 11.075 -0.152 36      9.04
      26.01 6458.360 10.934 -0.798 36      9.59
      26.01 6468.061 10.934 -0.729 21      9.03
      26.01 6482.240  6.219 -2.268 71      9.55
      26.01 6500.460 10.909 -0.395 36      9.19
      26.01 6524.690 10.987  0.564 69      9.12
      26.01 6531.150 11.049 -0.116 50      9.39
      26.01 6540.210 11.093 -0.319 40      9.34
      26.01 6541.360 11.050  0.452 61      9.07
      26.01 6586.690  5.605 -2.767 68      9.63
      26.01 6618.460  9.761 -1.324 28      9.31
      26.01 6627.200  7.274 -1.609 45      8.79
      26.01 6643.000 10.909 -0.768 24      9.19
      26.01 6647.700 10.909 -0.603 30      9.24
      26.01 6650.990  7.128 -2.594 25      9.14
      26.01 6664.480 11.049 -0.125 27      8.75
      26.01 6666.450  9.775 -1.325 22      9.14
      26.01 6684.190 10.909 -0.647 27      9.21
      26.01 6685.500 10.930 -0.718 23      9.15
      26.01 6708.910 10.909 -0.516 35      9.32
      26.01 6719.600 10.930 -0.520 29      9.14
      26.01 6724.330 10.930 -0.918 17      9.11
      26.01 6754.400 11.167 -0.339 24      8.94
      26.01 6763.990  6.803 -2.785 36      9.49
      26.01 6774.430 11.208 -0.391 30      9.22
      26.01 6777.250 11.445 -0.754 21      9.38
276                                        9.14
-------------------------------------------------------------------------------
Fe III26.02 4371.330  8.240 -2.992 13      8.75
      26.02 4382.510  8.248 -3.018 31      9.68
      26.02 4431.000  8.248 -2.572 37      9.48
      26.02 5086.690  8.659 -2.590 17      9.09
4                                          9.25
-------------------------------------------------------------------------------
Sr II 38.01 4077.709  0.000  0.167 syn     6.30
      38.01 4161.792  2.940 -0.502 45      5.78
      38.01 4305.443  3.040 -0.136 53      5.74
3                                          5.84
-------------------------------------------------------------------------------
Zr II 40.01 4149.217  0.802 -0.030 syn     4.60
      40.01 4496.98   0.713 -0.860 22      4.56
2                                          4.58
-------------------------------------------------------------------------------
Ba II 56.01 4554.029  0.000  0.170 syn  <= 2.40
1                                          2.40
-------------------------------------------------------------------------------
La II 57.01 4238.390  0.403 -0.280 10      4.10
1                                          4.10
-------------------------------------------------------------------------------
Ce II 58.01 4137.680  0.517  0.440 47      5.59
      58.01 4144.500  0.478 -0.230 27      5.38
      58.01 4152.000  0.684  0.510 35      5.08
      58.01 4165.630  0.910  0.530 42      5.47
      58.01 4185.400  0.417 -0.560 9       4.92
      58.01 4214.030  0.609 -0.470 24      5.58
      58.01 4248.680  0.684  0.140 25      5.06
      58.01 4373.800  0.561 -0.360 13      5.02
      58.01 4382.180  0.684  0.200 18      4.73
      58.01 4429.290  1.088  0.330 36      5.51
      58.01 4460.230  0.478  0.320 30      4.94
      58.01 4463.430  0.957  0.080 20      5.08
      58.01 4483.940  0.864  0.150 21      4.98
      58.01 4523.060  0.517 -0.030 28      5.22
      58.01 4527.350  0.320 -0.110 24      5.08
      58.01 4560.290  0.910  0.310 25      5.02
      58.01 4560.900  0.684 -0.170 10      4.75
      58.01 4562.380  0.478  0.230 32      5.07
      58.01 5274.260  1.044  0.150 32      5.46
19                                         5.15
-------------------------------------------------------------------------------
Pr II 59.01 4206.719  0.550  0.480 syn     4.70
      59.01 5173.902  0.968  0.340 syn     4.90
      59.01 5815.331  1.591  0.271 syn     4.90
3                                          4.83
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Pr III59.02 4437.610  0.000 -3.400 12       5.66
      59.02 4612.010  1.759 -1.260 28       5.10
      59.02 4642.260  0.960 -1.770 18       4.78
      59.02 4725.590  2.078 -1.320 28       5.33
      59.02 4775.300  1.947 -1.280 23       5.02
      59.02 4929.140  0.359 -1.880 24       4.80
      59.02 4964.580  0.173 -2.210 25       5.11
      59.02 5299.990  0.359 -0.530 80       5.55
      59.02 5449.380  0.359 -2.190 30       5.36
      59.02 5765.300  1.549 -1.100 22       4.65
      59.02 5844.450  1.244 -0.850 53       5.38
      59.02 5998.950  0.173 -1.800 44       5.39
      59.02 6090.000  0.359 -0.820 60       5.13
      59.02 6160.240  0.173 -0.980 61       5.20
      59.02 6195.630  0.000 -1.040 63       5.25
      59.02 6361.660  0.173 -2.080 20       4.80
      59.02 6500.080  1.722 -1.140 27       5.00
      59.02 6501.540  1.458 -1.400 36       5.44
      59.02 6616.529  1.549 -1.720 16       5.07
      59.02 6706.750  0.552 -1.640 32       5.04
20                                           5.15
-------------------------------------------------------------------------------
Nd II 60.01 4706.580  0.000 -0.880 10       5.44
      60.01 5130.600  1.304  0.570 34       5.63
2                                            5.54
-------------------------------------------------------------------------------
Nd III60.02 4483.400  0.631 -1.340 48       5.37
      60.02 4903.260  0.000 -1.830 syn      4.90
      60.02 4927.490  0.461 -0.830 63       5.34
      60.02 5085.000  0.296 -0.660 72       5.39
      60.02 5633.541  0.141 -2.060 syn      5.20
      60.02 5677.180  0.631 -1.410 49       5.48
      60.02 5845.000  0.631 -1.130 57       5.48
      60.02 6145.050  0.296 -1.290 57       5.43
      60.02 6327.260  0.141 -1.360 55       5.36
      60.02 6690.860  0.461 -2.310 29       5.53
10                                           5.39
-------------------------------------------------------------------------------
Sm II 62.01 4280.785  0.485 -0.331 syn      5.00
      62.01 4378.235  0.659 -0.590 syn      4.90
2                                            4.95
-------------------------------------------------------------------------------
Eu II 63.01 4129.725  0.000  0.204 syn      4.30
      63.01 4205.042  0.000  0.117 syn      4.00
      63.01 4435.578  0.207 -0.092 syn      4.10
      63.01 6645.030  1.380  0.204 23       4.37
4                                            4.25
-------------------------------------------------------------------------------
Gd II 64.01 4215.022  0.427 -0.550 20       4.85
1                                            4.85
-------------------------------------------------------------------------------
Tb III65.02 5847.232  0.348 -0.980 28       4.03
      65.02 6092.896  0.587 -1.110 22       4.07
      65.02 6687.698  1.027 -1.330 syn      4.10
34.06
-------------------------------------------------------------------------------
Dy III66.02 4355.296  0.516 -1.610 syn      4.60
      66.02 4363.489  1.151 -1.720 syn      4.60
      66.02 4401.567  0.881 -1.430 33       4.77
      66.02 4409.897  1.366 -1.620 syn      4.90
      66.02 4434.269  0.516 -1.270 syn      4.90
      66.02 4502.917  1.151 -1.950 24       5.07
      66.02 4510.027  0.881 -1.850 syn      4.90
      66.02 4995.538  0.881 -2.250 syn      5.00
      66.02 5099.734  0.881 -2.440 syn      5.20
9                                            4.89
-------------------------------------------------------------------------------
Ho III67.02 4416.250  0.000 -1.550 29       4.16
      67.02 4494.523  0.000 -1.360 syn      3.90
2                                            4.10
-------------------------------------------------------------------------------
Er II 68.01 4630.882  1.951  0.033 syn      4.48
1                                            4.48
-------------------------------------------------------------------------------
Er III68.02 4356.549  1.639 -1.460 syn      4.47
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      68.02 4422.410  0.000 -1.740 24       4.13
      68.02 4540.700  0.000 -2.540 16       4.61
      68.02 4735.510  0.630 -1.580 syn      3.90
      68.02 5068.447  1.546 -1.660 6        3.97
5                                           4.23
-------------------------------------------------------------------------
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