

Table S1 : Lines of heavy elements examined in the spectra of HD 209621

WL _{lab} (Å)	Atomic No.	E _{low}	log gf	EW (mÅ)	Remarks
4607.327	38.0	0.0000	-0.570	81.3	
6550.240	38.0	2.6904	+0.180	145.8	+ScII
4077.709	38.1	0.0000	+0.170		blended
4161.792	38.1	2.9405	-0.600		not detected
4215.519	38.1	0.0000	-0.170		not detected
4900.084	39.0	1.3983	-0.360	146.5	+YII+ErII
4883.685	39.1	1.0841	0.070	156.0	asymmetric: rw
4982.129	39.1	1.0326	-1.290	61.2	+Mn I
5087.416	39.1	1.0841	-0.170		asymmetric: rw
5123.211	39.1	0.9923	-0.830		shallow
5200.406	39.1	0.9920	-0.569	89.9	
5205.724	39.1	1.0326	-0.340	102.5	shallow
5473.388	39.1	1.7380	-1.020	81.1	+Mo I + Ce I
4414.124	40.0	0.1538	-2.320	86.8	
5311.434	40.0	0.5203	-1.710	113.3	+Nd II
5478.344	40.0	2.2012	-0.550	36.9	+Cr II
6134.585	40.0	0.0000	-1.280	30.1	asymmetric: lw
6140.460	40.0	0.5190	-1.410	73.0	asymmetric
4161.213	40.1	0.7133	-0.720		
4208.977	40.1	0.7133	-0.460		
4258.048	40.1	0.5686	-1.130		
4317.321	40.1	0.7133	-1.380	113.3	+Ce II
4404.750	40.1	1.8268	-1.400	241.9	shallow, +Fe I
4443.008	40.1	1.4859	-0.330		
4496.980	40.1	0.7133	-0.59		blended
4807.035	41.0	1.5005	-1.360	79.0	
4812.281	42.0	3.2654	-1.907	66.8	
5204.552	42.0	3.3596	-1.870	221.2	+Tm I
5991.331	42.0	3.4438	-1.638	70.4	
5991.370	42.0	3.4438	-1.638	67.6	
5752.022	44.0	1.0023	-2.960	66.2	+Fe I, V I
5907.660	56.0	1.1201	-1.030	106.7	broad
4130.645	56.1	2.7219	+0.560		absorption tip detected
4554.036	56.1	0.0000	0.120	729.2	asymmetric
4934.076	56.1	0.0000	-0.150	501.3	+Fe I
5853.668	56.1	0.6040	-1.020	239.7	asymmetric: rw
6141.727	56.1	0.7036	-0.076	350.4	
6496.897	56.1	0.6044	-0.377	375.2	shallow
5276.420	57.0	1.0472	-0.730	25.4	
4086.709	57.1	0.0000	-0.150	181.2	+Pr II
4123.218	57.1	0.3213	+0.120		shallow
4238.374	57.1	0.4030	-0.058		MC
4322.503	57.1	0.1729	-1.050		detected
4333.753	57.1	0.1729	-0.160		MC
4429.905	57.1	0.2349	-0.370		asymmetric: rw
4526.111	57.1	0.7721	-0.770	107.2	+Sr II, Cr I
4558.457	57.1	0.3213	-1.020		asymmetric: rw
4574.860	57.1	0.1729	-1.120		broad, asymmetric
4580.050	57.1	0.7090	-1.020	132.8	+CrI, FeII
4662.498	57.1	0.0000	-1.280		shallow
4748.726	57.1	0.9266	-0.860	72.5	asymmetric: rw
4840.000	57.1	0.3213	-2.070	62.4	
4999.461	57.1	0.4030	-0.890	201.9	+Ti I
5122.988	57.1	0.3213	-0.930		trace
5259.380	57.1	0.1729	-1.760	109.6	shallow
5808.313	57.1	0.0000	-2.200	79.7	shallow
6320.376	57.1	0.1729	-1.520		asymmetric: rw
4892.870	58.0	0.0283	-1.131	34.0	
5328.085	58.0	0.4930	0.006	229.9	rw not reaching the continuum
5688.493	58.0	0.5885	-0.712	81.7	+Nd II
5716.462	58.0	0.8476	-0.278	54.8	+Ti I

Table S1 (Cont.): Lines of heavy elements examined in the spectra of HD 209621

WL_{lab} (Å)	Z	E_{low}	$\log gf$	EW (mÅ)	Remarks
5878.026	58.0	0.4106	-1.235	126.3	shallow
6093.193	58.0	0.8029	-0.371	121.2	MC
6335.340	58.0	0.4667	-1.319	104.2	MC
4062.222	58.1	1.3658	0.350		asymmetric: lw
4065.162	58.1	0.9000	-0.640		not detected
4070.846	58.1	1.5332	-0.090		not detected
4073.474	58.1	0.4778	+0.32		not detected
4076.239	58.1	0.8081	-0.340		detected, as lw
4083.222	58.1	0.7007	+0.24		not detected
4117.288	58.1	0.7396	-0.450	40.8	MC
4119.008	58.1	0.5529	-0.530		absorption tip detected
4120.827	58.1	0.3200	-0.24		asymmetric: lw, MC
4127.364	58.1	0.6836	+0.24		detected, asymmetric: rw
4148.899	58.1	1.0898	0.040		not detected, weak feature !
4185.331	58.1	0.4170	-0.560		asymmetric: lw
4190.618	58.1	0.8969	-0.390		not detected
4193.871	58.1	0.5529	-0.40		not detected
4222.597	58.1	0.1224	-0.18	106.5	
4257.119	58.1	0.4592	-1.020	54.4	asymmetric: rw
4320.719	58.1	0.4592	-0.432	151.4	+Sc II
4336.244	58.1	0.7037	-0.564	89.1	MC
4418.780	58.1	0.8639	+0.310		shallow
4423.673	58.1	1.0578	-0.323	72.4	asymmetric: rw
4427.916	58.1	0.5359	-0.380		detected, shallow
4444.699	58.1	1.0578	0.100		not detected,
4460.207	58.1	0.4778	0.171	221.1	+Cr I
4485.515	58.1	0.9768	-0.720		not detected
4486.909	58.1	0.2953	-0.36		detected as a weak feature
4515.848	58.1	1.0578	-0.520		asymmetric: rw, MC
4522.079	58.1	0.8752	-1.494	69.3	Sc II
4523.075	58.1	0.5164	-0.304	166.2	asymmetric: rw, +Cr II
4527.348	58.1	0.3200	-0.462	170.8	asymmetric: rw, +Cr I
4539.745	58.1	0.3275	-0.459	128.8	shallow
4544.953	58.1	0.4170	-0.890		blended
4551.291	58.1	0.7401	-0.490		shallow
4562.359	58.1	0.4778	+0.330	139.0	DC
4628.161	58.1	0.5164	+0.26	148.9	asymmetric: rw
4744.944	58.1	0.4456	-1.672	79.2	asymmetric: lw
4747.167	58.1	0.3200	-1.246	72.6	asymmetric: lw, MC
4757.841	58.1	0.9564	-0.783	83.6	+Ru I
4773.941	58.1	0.9243	-0.498	73.2	asymmetric
4873.999	58.1	1.1069	-0.892	53.9	+Ti II
5022.867	58.1	1.0444	-0.723	92.3	+Ti I
5187.457	58.1	1.2110	-0.104	91.9	+Co I
5274.230	58.1	1.0444	0.323	94.8	asymmetric: rw
5330.556	58.1	0.8694	-0.760	69.9	
5512.064	58.1	1.0000	0.293	83.1	+C I
5975.818	58.1	1.3271	-0.810	52.4	+Sc I
5996.060	59.0	1.2007	-0.166	34.9	asymmetric: lw
4056.535	59.1	0.6298	0.640		DC
4062.805	59.1	0.4219	+0.33		not detected
4143.112	59.1	0.3717	0.380		not detected
4148.433	59.1	0.2162	-0.720		not detected
4171.820	59.1	0.3717	-0.340		not detected
4405.825	59.1	0.5501	-0.350		not detected
4535.923	59.1	0.0000	-0.980		not detected
4651.499	59.1	0.2044	-1.03		not detected
5188.217	59.1	0.9222	-1.145	43.2	+La II
5219.045	59.1	0.7952	-0.240	64.7	asymmetric: rw
5220.108	59.1	0.7957	+0.17	88	asymmetric: rw
5259.728	59.1	0.6334	+0.08	94	shallow
5285.657	59.1	0.4219	-1.047	41.1	+Cr I, Mn II
5292.619	59.1	0.6480	-0.300	72.5	

Table S1 (Cont.): Lines of heavy elements examined in the spectra of HD 209621

λ_{lab} (Å)	Z	E_{low}	$\log gf$	EW (mÅ)	Remarks
5322.772	59.1	0.4827	-0.315	109.9	
5331.460	59.1	0.6480	-0.973	21.3	+Co I
6432.680	60.0	1.2866	-0.160	98.16	
4051.141	60.1	0.3802	0.090	122.7	shallow
4059.951	60.1	0.2046	-0.360	85.7	asymmetric: lw
4061.080	60.1	0.4714	0.550	206.7	asymmetric
4069.265	60.1	0.0636	-0.400		asymmetric: lw
4109.448	60.1	0.3205	+0.18		detected
4133.351	60.1	0.3205	-0.340	128.6	
4232.374	60.1	0.0636	-0.35		detected
4256.821	60.1	0.18228	-1.390	50.9	asymmetric
4446.384	60.1	0.2046	-0.63		asymmetric: lw
4412.256	60.1	0.0636	-1.420	112.6	shallow
4420.516	60.1	0.3206	-1.710	178.5	+Ca I, Sm II
4451.563	60.1	0.3802	-0.040	149.7	+Fe II, Mn I
4451.980	60.1	0.0000	-1.340	112.7	+Fe I
4462.979	60.1	0.5595	0.070	221.5	+U II, broad
4556.133	60.1	0.0636	-1.610	118.0	asymmetric: rw
4594.445	60.1	0.2046	-1.550	63.9	+Ti I
4749.560	60.1	0.5595	-1.550	73.7	+Ti II
4797.153	60.1	0.5595	-0.950	75.1	
4819.640	60.1	0.1822	-2.260	63.4	+Y I
4825.478	60.1	0.1822	-0.860	122.5	+Ti I
4859.039	60.1	0.3205	-0.830	117.4	+Pr II
4876.112	60.1	0.5595	-1.670	51.1	
4989.953	60.1	0.6804	-1.400	134.3	+Sm II
5130.586	60.1	1.3040	+0.10		MC
5200.121	60.1	0.5590	-0.490	84.8	+Ce I + Mn I
5212.361	60.1	0.2046	-0.870	110.2	
5234.194	60.1	0.5502	-0.460		asymmetric: lw
5249.576	60.1	0.9756	0.210	97.7	+Ti I
5255.506	60.1	0.2046	-0.820	127.9	shallow
5276.878	60.1	0.8590	-0.440	72.5	+Ti I
5287.133	60.1	0.7446	-1.300	62.7	asymmetric: lw
5293.163	60.1	0.8229	-0.060	67.2	asymmetric: rw
5293.169	60.1	0.8230	-0.060	123.9	asymmetric: rw
5311.453	60.1	0.9857	-0.56		shallow
5319.815	60.1	0.5502	-0.210	124.2	
5361.467	60.1	0.6804	-0.400		out of range
5442.264	60.1	0.6804	-0.910		not detected
5594.416	60.1	1.1212	-0.040	125.6	+Ca I
5603.771	60.1	0.3802	-1.830	208.8	asymmetric, broad
5718.118	60.1	1.4102	-0.340	81.8	DC
5825.857	60.1	1.0807	-0.760	58.2	
6367.403	62.0	0.1846	-1.864	108.3	
6471.629	62.0	1.7550	-0.467	141.6	asymmetric: lw
4068.324	62.1	0.4338	-0.710		detected, DC
4220.661	62.1	0.5438	-0.400	62.7	asymmetric: rw
4244.696	62.1	0.2774	-0.730	78.1	shallow, DC
4318.927	62.1	0.2774	-0.270	92.94	detected, DC, asymmetric: rw
4424.337	62.1	0.4847	-0.260	137.3	a shallow feature, DC
4434.318	62.1	0.3785	-0.576	137.9	asymmetric
4458.509	62.1	0.1039	-1.110	90.9	+Co I, Ca I
4472.409	62.1	0.1846	-1.363	42.2	+V I
4499.475	62.1	0.2483	-1.413	167.7	as
4519.630	62.1	0.5438	-0.430		detected, DC, shallow
4536.512	62.1	0.1039	-1.396		not detected
4537.941	62.1	0.4847	-0.230		detected, asymmetric: rw
4543.943	62.1	0.3333	-1.002	165.0	
4552.661	62.1	0.2483	-1.06		not detected
4566.202	62.1	0.3333	-0.920		asymmetric: lw
4577.688	62.1	0.2483	-0.77		not detected
4584.826	62.1	0.4338	-0.750		asymmetric: lw
4593.535	62.1	0.3785	-0.980		DC
4595.283	62.1	0.4847	-1.028	90.9	asymmetric: lw

Table S1 (Cont.): Lines of heavy elements examined in the spectra of HD 209621

WL _{lab} (Å)	Z	E _{low}	log g _f	EW (mÅ)	Remarks
4615.444	62.1	0.5438	-1.262	74.8	asymmetric: rw, broad
4642.228	62.1	0.3785	-0.520		+V I, C I
4674.593	62.1	0.1846	-0.560		asymmetric: lw
4687.189	62.1	0.0405	-1.170		MC
4726.026	62.1	0.3333	-1.849	76.9	+Yb II
4791.580	62.1	0.1039	-1.846	46.7	+Sc I, V II
5801.616	62.1	1.3580	-2.209	79.8	+K I
4129.725	63.1	0.0000	+0.204		not detected
4205.042	63.1	0.0000	+0.117		not detected
4435.578	63.1	0.2069	-0.090		not detected
4522.581	63.1	0.2069	-0.678		not detected
6437.640	63.1	1.3197	-0.276	50.8	a shallow feature
6645.064	63.1	1.3798	+0.204		not detected
4037.893	64.1	0.5559	+0.070		out of range
4070.274	64.1	0.5559	-0.510		broad, asymmetric: rw
4073.192	64.1	0.4270	-0.700		not detected
4085.580	64.1	0.7312	-0.230		not detected
4215.022	64.1	0.4270	-0.580		not detected, MC
4191.075	64.1	0.4270	-0.680		appears as a shallow feature, MC
4749.143	64.0	2.0779	0.202	54.6	appears as a shallow feature, DC
5916.749	64.0	0.8807	-0.940	93.4	
4570.984	64.1	1.2885	-1.329	168.5	+Th I
4570.984	64.1	1.2885	-1.329	168.5	+Th I, Cr I
4077.966	66.1	0.1027	-0.025		appears as a broad shallow feature, MC
4103.306	66.1	0.1027	-0.370		asymmetric: lw, MC
4468.138	66.1	0.1027	-1.50		MC, +Ti I
5169.688	66.1	0.1027	-1.660		not detected
4759.671	68.1	0.0000	-1.904	68.9	+Mo I, Co I
4820.354	68.1	1.4022	-0.486	115.6	+Sc I, Ti II
6131.531	69.0	2.0405	-1.003	77.2	asymmetric: rw
6175.294	69.0	1.6267	-1.475	63.6	+Ce I
4093.155	72.1	0.4519	-1.390		MC, asymmetric: lw
4461.181	72.0	0.6991	-1.420	185.6	+Fe I, Ce II
6318.323	72.0	2.3921	-1.390	112.6	+V I
4566.845	73.0	3.2146	-0.100	122.0	appears as a shallow feature
4756.512	73.0	0.4914	-1.610	42.3	+Fe I, Ni I
5341.025	73.0	0.4914	-2.000	165.2	+Fe I
5341.020	73.0	0.4919	-2.000	164.0	Ta I
6325.102	73.0	0.7500	-2.150	135.4	+Sc II
4757.542	74.0	0.3659	-2.430	59.8	+Cr I
5793.036	74.0	3.4299	-0.690	109.0	asymmetric: lw
5864.619	74.0	2.4584	-1.440	82.3	appears as a shallow feature
5275.548	75.0	0.0000	-1.110	31.7	+W I, V II
4048.054	76.0	1.9083	-1.000	88.9	asymmetric: rw
4793.996	76.0	0.5157	-1.990	40.0	
4865.607	76.0	3.7931	0.310	65.7	+Ti II
4135.775	76.1	0.5157	-1.260		+Cr II, MC
4420.468	76.1	0.0000	-1.530		not detected
4057.807	82.0	1.3205	-0.200		MC
4486.897	90.0	0.3171	-1.870	132.9	+Gd I, Ce II
4505.217	90.0	1.0911	-0.769	91.8	+Cr I
4283.518	90.1	1.1454	-1.206	36.4	+Cr II
4532.258	90.1	1.5480	-1.003	126.0	shallow, +Ca I, MC
4575.426	90.1	1.7700	-1.405	172.4	asymmetric: rw, broad, MC
4726.336	90.1	0.2306	-2.814	99.0	MC
5700.459	90.1	1.2042	-2.148	67.1	+Cr I
4252.426	92.1	0.5481	-1.251	86.8	+Cr I

“+X” indicates the line is blended with contributions from element X

“DC”: uncertainty in placing continuum

“MC”: affected by molecular contamination

“shallow” indicates the wings of the line profile do not reach continuum

“lw”: left wing

“rw”: right wing