**Table 11.** Absorption lines in the spectrum of the proto-Planetary Nebula HDE 341617

| Species | $\lambda_{obs}$ ( Å ) | $\lambda_{lab}$ ( Å ) | $Eq.W.$ ($m$ Å) | $Vr$ ($km\ s^{-1}$) | Species | $\lambda_{obs}$ ( Å ) | $\lambda_{lab}$ ( Å ) | $Eq.W.$ ($m$ Å) | $Vr$ ($km\ s^{-1}$) |
|---|---|---|---|---|---|---|---|---|---|
| He I | 4010.217 | 4009.270 | 223.2 | 70.9 | O II | 4642.973 | 4641.811 | 233.6 | 75.1 |
| He I | 4027.047 | 4026.362 | 337.0 | 48.6 | O II | 4643.039 | 4641.82 | 302.9 | 78.8 |
| He I | 4144.569 | 4143.759 | 391.9 | 51.0 | O II | 4650.29 | 4649.139 | 309.0 | 74.3 |
| O II: | 4350.53 | 4349.426 | 267.7 | 76.1 | O II | 4662.795 | 4661.635 | 150.4 | 74.7 |
| O II | 4367.922 | 4366.896 | 208.3 | 70.5 | O II+C III | 4674.776 | 4673.91/73.75 | 58.6 | |
| He I | 4389.027 | 4387.929 | 325.8 | 75.1 | O II | 4677.389 | 4676.234 | 84.8 | 74.1 |
| O II | 4415.984 | 4414.909 | 141.5 | 73.0 | O II | 4706.507 | 4705.355 | 70.2 | 73.4 |
| O II | 4418.081 | 4416.975 | 104.7 | 75.1 | He I | 4714.39 | 4713.143 | 160.8 | 79.4 |
| He I | 4472.59 | 4471.477 | 446.8 | 74.7 | He I | 4922.992 | 4921.929 | 516.4 | 64.8 |
| Si III | 4553.727 | 4552.654 | 322.4 | 70.7 | He I: | 5015.647 | 5015.675 | 217.2 | |
| Si III | 4568.918 | 4567.872 | 280.0 | 68.7 | Fe II | 5796.901 | 5795.870 | 152.8 | 53.4 |
| Si III | 4575.818 | 4574.777 | 229.7 | 68.3 | He Ibld | 5875.849 | 5875.618+75.650 | 542.5 | |
| O II | 4592.136 | 4590.971 | 209.9 | 76.1 | He I | 6679.176 | 6678.149 | 841.9 | 46.1 |
| O II | 4639.951 | 4638.854 | 136.3 | 70.9 | | | | | |

**Table 12.** Emission lines in the spectrum of the proto-Planetary Nebula HDE 341617

| Species | $\lambda_{obs}$ ( Å ) | $\lambda_{lab}$ ( Å ) | $Eq.W.$ ($m$ Å) | $Vr$ ($km\ s^{-1}$) | Species | $\lambda_{obs}$ ( Å ) | $\lambda_{lab}$ ( Å ) | $Eq.W.$ ($m$ Å) | $Vr$ ($km\ s^{-1}$) |
|---|---|---|---|---|---|---|---|---|---|
| [S II] | 4069.357 | 4068.600 | 545.7 | 55.8 | [Cr I: ] | 5147.604 | 5146.550 | 86.5 | 61.4 |
| [Fe II] | 4244.732 | 4243.980 | 266.3 | 53.1 | [Fe II] | 5158.931 | 5158.000 | 155.2 | 54.1 |
| [Fe II] | 4245.566 | 4244.810 | 50.0 | 53.4 | [Fe II] | 5159.702 | 5158.810 | 367.9 | 51.8 |
| [Fe II] | 4277.632 | 4276.83 | 237.5 | 56.2 | [Fe II] | 5164.910 | 5163.940 | 108.9 | 56.4 |
| [Fe II] | 4306.718 | 4305.900 | 60.2 | 57.0 | Fe II | 5169.933 | 5169.030 | 164.1 | 52.4 |
| $H_\gamma$ | 4341.315 | 4340.475 | 1030.0 | | [Fe II] | 5182.956 | 5181.970 | 89.0 | 57.1 |
| [Fe II] | 4353.553 | 4352.78 | 100.5 | 58.8 | [Fe II] | 5200.056 | 5199.180 | 43.0 | 50.5 |
| [Fe II] | 4359.146 | 4358.370 | 117.9 | 53.4 | [Fe II] | 5221.008 | 5220.060 | 74.3 | 54.5 |
| [Fe II] | 4360.112 | 4359.190 | 496.6 | 53.1 | [Fe II] | 5262.580 | 5261.610 | 463.8 | 55.3 |
| O I | 4369.018 | 4368.30 | 100.9 | 49.3 | [Fe II] | 5269.799 | 5268.880 | 58.5 | 52.3 |
| Fe II | 4373.130 | 4372.220 | 37.1 | 62.4 | [Fe II] | 4288.157 | 4287.40 | 625.2 | 53.0 |
| [Fe II] | 4383.621 | 4382.750 | 81.0 | 59.6 | [Fe II] | 5274.345 | 5273.380 | 383.7 | 54.9 |
| Fe II | 4385.381 | 4384.330 | 24.7 | 71.9 | O I | 5276.020 | 5275.080 | 29.2 | 53.5 |
| [Fe II] | 4414.564 | 4413.780 | 398.2 | 53.3 | Fe II | 5279.221 | 5278.265 | 21.1 | 54.3 |
| [Fe II] | 4417.075 | 4416.270 | 356.9 | 54.7 | Fe III | 5292.588 | 5291.780 | 46.7 | 45.0 |
| [FeII] | 4458.737 | 4457.95 | 221 | 52.9 | [Fe II] | 5297.799 | 5296.840 | 78.1 | 54.3 |
| [Fe II] | 5413.604 | 5412.640 | 50.3 | 53.4 | O I | 5299.961 | 5299.000 | 117.2 | 54.4 |
| [FeII] | 4475.767 | 4474.91 | 85 | 53.0 | Fe II | 5317.554 | 5316.609 | 23.9 | 53.3 |
| [FeII] | 4489.560 | 4488.75 | 85 | 51.0 | [Fe II] | 5334.587 | 5333.650 | 295.0 | 52.7 |
| [FeII] | 4493.412 | 4492.64 | 38 | 53.4 | [Fe II] | 5348.652 | 5347.690 | 30.0 | 54.0 |
| [FeII] | 4529.249 | 4528.39 | 18 | 56.4 | [Fe II] | 5377.438 | 5376.470 | 234.3 | 54.0 |
| [FeII] | 4728.955 | 4728.07 | 170 | 56.4 | [Fe II] | 5434.124 | 5433.150 | 86.1 | 53.8 |
| Fe III | 4734.765 | 4733.900 | 14.9 | 54.8 | [Fe II] | 5478.195 | 5477.250 | 43.9 | 51.8 |
| [FeII] | 4775.615 | 4774.74 | 110 | 54.4 | O I | 5513.699 | 5512.710 | 30.0 | 53.8 |
| [Fe II] | 4799.149 | 4798.29 | 25.9 | 53.7 | O I | 5555.937 | 5554.940 | 60.0 | 53.8 |
| [Fe II] | 4815.394 | 4814.5 | 325.9 | 52.8 | [Fe II] | 5747.997 | 5746.960 | 130.2 | 54.1 |
| $H_\beta$ | 4862.284 | 4861.332 | 2921.0 | 58.7 | [N II] | 5755.637 | 5754.800 | 157.5 | 43.6 |
| [Fe II] | 4875.354 | 4874.490 | 116.5 | 53.2 | Si II | 5958.641 | 5957.612 | 149.5 | 51.8 |
| [Fe II] | 4890.511 | 4889.630 | 288.0 | 54.1 | O I | 5959.607 | 5958.46+58.630 | | |
| [Fe II] | 4906.204 | 4905.350 | 256.0 | 52.2 | Si II o FeIII | 5979.989 | 5978.970 | 425.3 | 51.1 |
| Fe II | 4924.813 | 4923.921 | 86.3 | 54.3 | O I bld | 6047.481 | 6046.26+6046.46 | 427.2 | 60.6 |
| [Fe II] | 4951.656 | 4950.740 | 46.0 | 55.5 | Si II(2)+[NII] | 6348.259 | 6347.090 | 517.8 | 55.3 |
| [Fe II] | 4974.283 | 4973.390 | 101.5 | 53.9 | [O I] | 6364.896 | 6363.88 | 277.7 | 47.9 |
| uf[1] | 4981.034 | | 113.5 | | uf[1] | 6366.259 | | 126.3 | |
| [Fe II] | 5006.441 | 5005.520 | 69.1 | 43.2 | Si II(2) | 6372.505 | 6371.359 | 242.9 | 54.0 |
| Fe II | 5019.322 | 5018.434 | 97.5 | 53.17 | [N II](1) | 6549.274 | 6548.100 | 666.1 | 53.8 |
| [Fe II] | 5021.110 | 5020.240 | 107.4 | 52.0 | Hα | 6564.138 | 6562.817 | 43.97 | 60.3 |
| Si II | 5041.962 | 5041.063 | 61.9 | 53.5 | [N II](1) | 6584.646 | 6583.6 | 2105.0 | 47.7 |
| [Fe II] | 5044.422 | 5043.530 | 58.1 | 53.1 | [O II] | 6668.000 | 6666.940 | 160.2 | 47. |
| Si II | 5056.882 | 5056.020 | 178.0 | 51.1 | [S II] | 6717.786 | 6716.470 | 81.1 | 58.8 |
| [Fe II] | 5108.814 | 5107.950 | 57.1 | 50.7 | [S II] | 6731.874 | 6730.850 | 93.3 | 45.6 |
| [Fe II] | 5112.558 | 5111.630 | 88.8 | 54.5 | [S II] | 6732.169 | 6731.300 | 114.5 | 38.72 |

1 – uf = unidentified feature.