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An X-ray view of gas and dust in the diffuse interstellar medium

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A

Appendices to Chapter 2

A.1 Dust extinction cross sections in the oxygen K-edge

We present the calculated dust extinction cross sections in the oxygen K-edge. The cross sections were calculated from laboratory data of 18 dust samples with different chemical compositions. The resolution of the laboratory measurements is 0.25 eV.

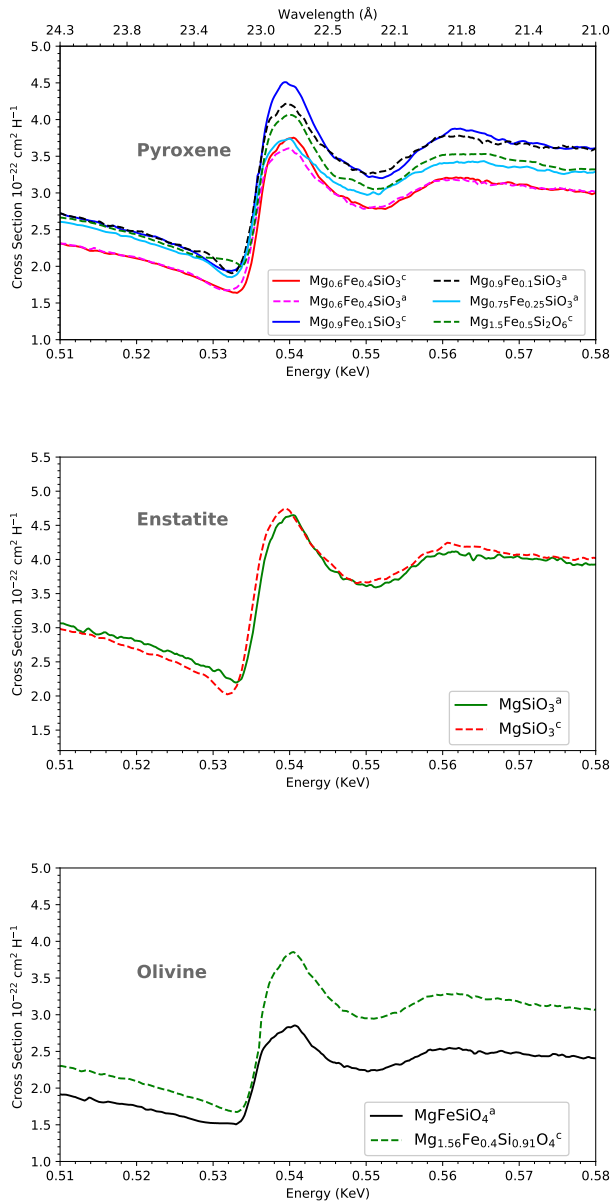


Figure A.1: Calculated dust extinction cross sections. The symbol *a* refers to amorphous compounds and *c* to crystalline.

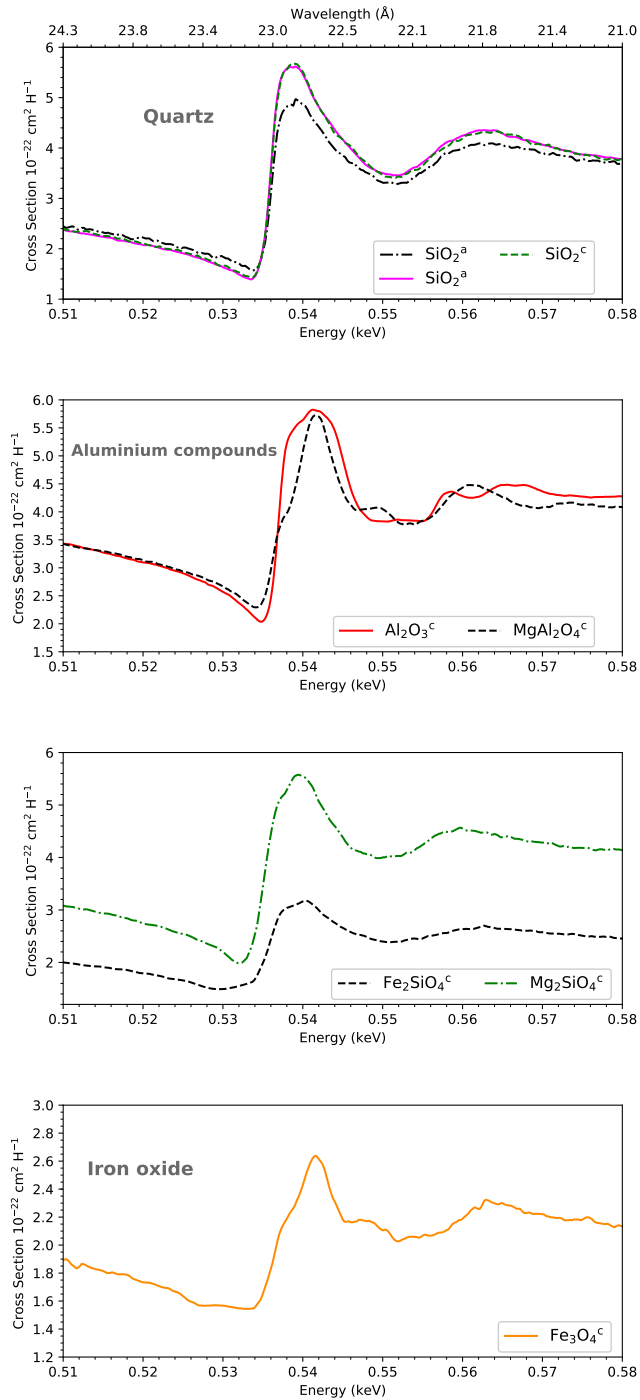


Figure A.2: Calculated dust extinction cross sections. The symbol *a* refers to amorphous compounds and *c* to crystalline.

A.2 Atomic oxygen lines in spex

In the following tables we present the wavelength, energy and oscillator strength of the atomic oxygen lines (OI, OII, OIII) implemented into SPEX. λ and E are the line wavelength and energy, respectively. f_{osc} is the oscillator strength and it is dimensionless.

Table A.1: OI lines implemented into SPEX

$\lambda(\text{\AA})$	E(eV)	f_{osc}
22.5760	549.1673	4.70×10^{-6}
22.5760	549.1673	1.03×10^{-5}
22.5761	549.1648	6.31×10^{-6}
22.5772	549.1381	6.55×10^{-6}
22.5773	549.1356	9.08×10^{-6}
22.5773	549.1356	1.45×10^{-5}
22.5778	549.1235	9.27×10^{-6}
22.5781	549.1155	1.32×10^{-5}
22.5785	549.1075	2.08×10^{-5}
22.5788	549.0995	1.36×10^{-5}
22.5791	549.0915	1.95×10^{-5}
22.5794	549.0835	3.08×10^{-5}
22.5798	549.0755	2.07×10^{-5}
22.5801	549.0675	4.88×10^{-5}
22.5804	549.0596	3.08×10^{-5}
22.5808	549.0516	2.69×10^{-5}
22.5811	549.0436	7.50×10^{-5}
22.5814	549.0356	4.90×10^{-5}
22.5817	549.0276	2.60×10^{-6}
22.5991	548.6059	3.58×10^{-6}
22.6000	548.5841	4.58×10^{-5}
22.6003	548.5768	1.26×10^{-4}
22.6004	548.5744	8.36×10^{-5}
22.6225	548.0385	8.28×10^{-5}
22.6234	548.0167	6.55×10^{-6}
22.6244	547.9924	8.32×10^{-6}
22.6246	547.9876	1.18×10^{-4}
22.6247	547.9852	3.56×10^{-4}
22.6251	547.9755	2.59×10^{-4}
22.6861	546.5020	4.06×10^{-4}
22.6904	546.3985	1.05×10^{-4}
22.6913	546.3768	1.59×10^{-4}
22.6915	546.3720	5.88×10^{-5}
22.6922	546.3551	4.52×10^{-4}

Table A.2: O I lines implemented into SPEX

$\lambda(\text{\AA})$	E(eV)	f_{osc}
22.6926	546.3455	1.22×10^{-3}
22.7727	544.4238	4.79×10^{-6}
22.7735	544.4047	4.42×10^{-6}
22.7735	544.4047	1.79×10^{-5}
22.7736	544.4023	2.62×10^{-6}
22.7736	544.4023	2.64×10^{-6}
22.7736	544.4023	2.53×10^{-6}
22.7739	544.3951	4.78×10^{-6}
22.7740	544.3927	3.24×10^{-6}
22.7746	544.3784	8.22×10^{-5}
22.7747	544.3760	1.93×10^{-5}
22.7748	544.3736	1.21×10^{-5}
22.7748	544.3736	6.07×10^{-6}
22.7749	544.3712	8.63×10^{-6}
22.7749	544.3712	1.69×10^{-5}
22.7749	544.3712	9.12×10^{-6}
22.7756	544.3545	6.55×10^{-6}
22.7758	544.3497	1.11×10^{-5}
22.7760	544.3449	6.93×10^{-5}
22.7761	544.3425	2.62×10^{-5}
22.7762	544.3401	3.06×10^{-5}
22.7765	544.3330	3.43×10^{-6}
22.7766	544.3306	2.82×10^{-6}
22.7766	544.3306	3.83×10^{-6}
22.7766	544.3306	4.21×10^{-6}
22.7777	544.3043	3.80×10^{-5}
22.7777	544.3043	8.45×10^{-5}
22.7779	544.2995	4.16×10^{-5}
22.7789	544.2756	1.98×10^{-5}
22.7790	544.2732	2.27×10^{-6}
22.7791	544.2708	7.19×10^{-6}
22.7792	544.2685	6.95×10^{-6}
22.7792	544.2685	7.73×10^{-6}
22.7801	544.2470	1.08×10^{-4}
22.7802	544.2446	4.81×10^{-5}
22.7804	544.2398	6.03×10^{-5}
22.7817	544.2087	6.05×10^{-6}
22.7822	544.1968	9.35×10^{-6}
22.7827	544.1848	3.33×10^{-5}
22.7828	544.1825	2.58×10^{-6}
22.7830	544.1777	1.22×10^{-5}
22.7831	544.1753	1.41×10^{-5}

Table A.3: O I lines implemented into SPEX

$\lambda(\text{\AA})$	E(eV)	f_{osc}
22.7831	544.1753	1.39×10^{-5}
22.7839	544.1562	1.18×10^{-4}
22.7840	544.1538	5.50×10^{-5}
22.7843	544.1466	9.08×10^{-5}
22.7873	544.0750	1.22×10^{-5}
22.7880	544.0583	3.84×10^{-5}
22.7886	544.0440	3.93×10^{-5}
22.7889	544.0368	2.20×10^{-5}
22.7891	544.0320	3.51×10^{-5}
22.7891	544.0320	2.82×10^{-5}
22.7896	544.0201	1.14×10^{-4}
22.7899	544.0129	5.20×10^{-5}
22.7902	544.0058	1.33×10^{-4}
22.7976	543.8292	1.19×10^{-4}
22.7983	543.8125	5.00×10^{-4}
22.7998	543.7767	6.27×10^{-5}
22.8001	543.7695	1.28×10^{-5}
22.8001	543.7695	6.65×10^{-5}
22.8003	543.7648	1.60×10^{-4}
22.8006	543.7576	9.33×10^{-5}
22.8008	543.7529	1.22×10^{-4}
22.8013	543.7409	4.09×10^{-5}
22.8015	543.7362	2.34×10^{-4}
22.8193	543.3120	1.18×10^{-4}
22.8200	543.2954	5.41×10^{-4}
22.8233	543.2168	4.05×10^{-6}
22.8236	543.2097	4.01×10^{-4}
22.8238	543.2049	1.18×10^{-5}
22.8240	543.2001	2.81×10^{-4}
22.8249	543.1787	9.06×10^{-4}
22.8251	543.1740	4.02×10^{-5}
22.8258	543.1573	2.78×10^{-4}
22.8264	543.1430	8.49×10^{-6}
22.8275	543.1169	2.70×10^{-6}
22.8754	541.9796	4.28×10^{-4}
22.8761	541.9630	1.55×10^{-3}
22.8858	541.7333	1.09×10^{-3}
22.8882	541.6765	7.03×10^{-5}
22.8888	541.6623	8.73×10^{-4}
22.8898	541.6386	4.28×10^{-3}
22.8931	541.5606	6.56×10^{-6}
22.8937	541.5464	3.99×10^{-5}
23.5100	527.3501	3.46×10^{-2}
23.5114	527.3187	1.04×10^{-1}

Table A.4: O II lines implemented into SPEX

$\lambda(\text{\AA})$	E(eV)	f_{osc}
21.6791	571.8872	1.59×10^{-4}
21.6791	571.8872	2.37×10^{-4}
21.6992	571.3575	2.19×10^{-4}
21.6992	571.3575	3.24×10^{-4}
21.6993	571.3548	1.01×10^{-4}
21.7183	570.8550	3.23×10^{-4}
21.7184	570.8524	1.08×10^{-4}
21.7184	570.8524	2.16×10^{-4}
21.7353	570.4085	7.29×10^{-4}
21.7354	570.4059	2.47×10^{-4}
21.7399	570.2878	2.93×10^{-4}
21.7400	570.2852	1.88×10^{-4}
21.7720	569.4470	3.11×10^{-4}
21.7722	569.4418	2.05×10^{-4}
21.8077	568.5148	1.39×10^{-3}
21.8078	568.5122	9.37×10^{-4}
21.8079	568.5096	4.72×10^{-4}
21.8367	567.7598	1.37×10^{-3}
21.8368	567.7572	4.51×10^{-4}
21.8368	567.7572	9.07×10^{-4}
21.9018	566.0722	3.84×10^{-4}
21.9020	566.0670	7.68×10^{-4}
21.9022	566.0619	1.13×10^{-3}
21.9651	564.4409	3.54×10^{-3}
21.9653	564.4357	2.35×10^{-3}
21.9654	564.4332	1.17×10^{-3}
21.9829	563.9838	6.11×10^{-4}
21.9831	563.9787	4.44×10^{-4}
21.9832	563.9761	2.32×10^{-4}
21.9973	563.6146	4.54×10^{-3}
21.9974	563.6121	2.99×10^{-3}
21.9975	563.6095	1.49×10^{-3}
22.0086	563.3252	1.59×10^{-3}
22.0086	563.3252	4.75×10^{-3}
22.0335	562.6886	2.76×10^{-4}
22.0335	562.6886	4.15×10^{-4}
22.0961	561.0945	1.57×10^{-3}
22.0961	561.0945	3.14×10^{-3}
22.0962	561.0920	4.71×10^{-3}
22.2625	556.9006	1.28×10^{-2}
22.2625	556.9006	4.28×10^{-3}
22.2625	556.9006	8.55×10^{-3}
23.3499	530.9659	3.35×10^{-2}
23.3506	530.9500	6.70×10^{-2}
23.3517	530.9249	1.01×10^{-1}

Table A.5: O III lines implemented into SPEX

$\lambda(\text{\AA})$	E(eV)	f_{osc}
20.7883	596.3932	1.24×10^{-3}
20.7956	596.1838	3.05×10^{-4}
20.7975	596.1293	9.58×10^{-4}
20.8260	595.3136	2.57×10^{-4}
20.8286	595.2392	2.23×10^{-4}
20.8519	594.5741	1.36×10^{-3}
20.8625	594.2720	5.32×10^{-4}
20.8646	594.2122	1.50×10^{-3}
20.8905	593.4755	5.66×10^{-4}
20.8938	593.3818	7.06×10^{-4}
20.9735	591.1269	2.87×10^{-3}
21.0036	590.2798	6.80×10^{-3}
21.0101	590.0971	1.00×10^{-2}
21.0280	589.5948	3.77×10^{-4}
21.0284	589.5836	2.63×10^{-4}
21.0322	589.4771	1.73×10^{-4}
21.0784	588.1851	3.28×10^{-3}
21.0859	587.9759	6.38×10^{-3}
21.0945	587.7361	1.21×10^{-3}
21.0957	587.7027	1.71×10^{-4}
21.1666	585.7341	1.11×10^{-3}
21.2056	584.6569	4.75×10^{-4}
21.2066	584.6293	1.35×10^{-2}
21.2240	584.1500	4.84×10^{-3}
21.2855	582.4622	2.23×10^{-3}
21.3140	581.6834	2.44×10^{-3}
21.3252	581.3779	4.79×10^{-3}
21.3428	580.8985	3.40×10^{-3}
21.3584	580.4742	6.00×10^{-3}
21.5092	576.4045	1.33×10^{-2}
21.5313	575.8129	2.34×10^{-2}
21.5836	574.4176	5.45×10^{-3}
22.9400	540.4534	6.89×10^{-2}
23.0280	538.3880	1.04×10^{-1}
23.0710	537.3846	1.26×10^{-1}