Electromagnetic spectrum description in UCD Version 0.3

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Division of the electromagnetic spectrum

This note describes the division of the electromagnetic spectrum for the UCD needs. We describe here the top level domains, which should be comparable to the division made in the spectral coverage of Resource Metadata description (radio, mm, infrared, optical, UV, X-ray, Gamma-ray). We also indicate the main divisions in each of the top-level domains.

UCD designation	Wavelength	Frequency	Energy	Notes
Radio Regime				
em.radio.20-100MHz	>3m	<100MHz		
em.radio.100-200MHz	1.5–3m	100–200MHz		
em.radio.200-400MHz	75–150cm	200–400MHz		
em.radio.400-750MHz	40–75cm	400–750MHz		
em.radio.750-1500MHz	20–40cm	750–1500MHz		21cm line
em.radio.1500-3000MHz	10–20cm	1.5–3GHz		
em.radio.3-6GHz	5–10cm	3–6GHz		
em.radio.6-12GHz	2.5–5cm	6–12GHz		

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(table continued...)

em.radio.12-30GHz	1–2.5cm	12–30GHz		
Millimetric Regime				
em.mm.30-50GHz	6–10mm	30–50GHz		
em.mm.50-100GHz	3–6mm	50–100GHz		
em.mm.100-200GHz	1.5–3mm	100–200GHz		CO
em.mm.200-400GHz	750–1500µm	200–400GHz		
em.mm.400-750GHz	400–750µm	400–750GHz		
em.mm.750-1500GHz	200–400µm	750–1500GHz		COBE 240µm
em.mm.1500-3000GHz	100–200µm	1500–3000GHz		COBE 140µm
Infra-Red Regime				
em.IR.60-100um	60–100µm	3–5THz		IRAS 100µm
em.IR.30-60um	30–60µm	5–10THz		IRAS 60µm
em.IR.15-30um	15–30µm	10–20THz		IRAS 25µm
em.IR.8-15um	8–15µm	20–37.5THz		N band; IRAS 12µm
em.IR.4-8um	4–8µm	37.5–75THz		M band; Brα =4051nm
em.IR.3-4um	3–4µm	75–100THz		L, L', L"
em.IR.K	2–3µm	100–150THz		K band
em.IR.H	1.5–2.0µm	150–200THz		H band; Paα =1875nm, BrLimit =1731nm
em.IR.J	1.0–1.5µm	200–300THz		J band;
Optical Regime				
em.opt.I	750–1000nm	300–400THz	1.2–1.6eV	I band; PaLimit =820nm
em.opt.R	600–750nm	400–500THz	1.6–2.0eV	R band; Hα =656nm
em.opt.V	500–600nm	500–600THz	2.0–2.4eV	V band;
em.opt.B	400–500nm	600–750THz	2.4–3.0eV	B band; Hβ =486nm, Hγ =434nm, Hδ =410nm
em.opt.U	300–400nm	750–1000THz	3.0–4.0eV	U band; BaJump =365nm
Ultra-Violet Regime				
em.UV.200-300nm	200–300nm	1000–1500THz	4–6eV	UV1 band
em.UV.100-200nm	100–200nm	1500–3000THz	6–12eV	UV2 band; Lyα =121.6nm
em.UV.50-100nm	50–100nm	3–6PHz	12–24eV	LyLimit =91.2nm
em.UV.10-50nm	10–50nm	6–30PHz	24–120eV	
X-ray Regime				
em.X-ray.soft	6–100Å	30–500PHz	0.12–2keV	
em.X-ray.medium	1–6Å	0.5–3EHz	2–12keV	
em.X-ray.hard	0.1–1Å	3–30EHz	12–120keV	
Gamma Regime				
em.gamma.soft	0.25–10pm	30–1200EHz	120–500keV	
em.gamma.hard	< 250fm	> 1200EHz	> 500keV	e^+/e^-

Table 1: Division of the electromagnetic spectrum.

Changes from UCD 1.9.9

This note is based on section 10 of UCD version 1.9.9 document, with the following changes:

- The radio spectrum is divided in 2 parts: **radio** for wavelengths greater than 1cm, and **mm** between 0.1 and 10mm. This changes a boundary from 25GHz to 30GHz.
- There were 2 inversions of the frequency ranges in the IR regime: 75–100THz vs 100–150THz and 150–200THz vs 200–300THz. This has been corrected.
- There was an error of conversion from wavelength to energy for the boundary between X-ray and gamma: 0.1Å was the right value, which corresponds to 120keV (and not 12keV). Thus, the division is the same as in the RM document.
- We introduce a vhard band for Xray, to distinguish 2–12keV from 12–120keV.
- Notes were added for 21cm and CO emission.

Changes from 0.1

- UV and EUV have been merged to follow the Resource Metadata v1.01 document.

Changes from 0.2

- X-ray **hard** and **vhard** become **medium** and **hard**, respectively.