

Fig. 9.1. The spectral distributions of various radio sources. The Moon, the quiet Sun and (at lower frequencies) the H II region Orion A are examples of Black Bodies. Close to 300 GHz there is additional emission from dust in the molecular cloud Orion KL. The active Sun, supernova remnants such as Cassiopeia A, the radio galaxies Cygnus A, Virgo A (Messier 87, 3C274) and the Quasi Stellar radio source (QSO) 3C273 are nonthermal emitters. The hatching around the spectrum of 3C273 is meant to indicate rapid time variability. (The 3C catalog is the fundamental list of intense sources at 178 MHz (Bennett 1962))

Radio image of the Moon



The radio image of the moon was made using NRAO's 140ft telescope in Green Bank, West Virginia. Our unusally large moon (its diameter is roughly one-fourth that of Earth's) orbits us at 236,000 miles away, on average. This image shows the moon in radio wavelengths, with blue colors representing colder areas of the moon and red colors representing the warmer areas of the moon. The Moon is heated by the Sun and the redder region was facing the Sun at the time of observation.

Radio image of Saturn



The radio wavelength image from NRAO's VLA shows Saturns rings scatter and/or absorb the thermal emission from saturns surface.

Radio image of M17



VLA Radio Image of M17

The radio image of M17 depicts the distribution of ionized hydrogen (hydrogen atoms with their electrons stripped away) in what astronomers refer to as "HII regions".



General Electric synchrotron accelerator built in 1946, the origin of the discovery of synchrotron radiation.

Synchrotron radiation spectrum



F(x) and G(x)



Fig. 9.8. The spectral distribution of the power of synchrotron radiation. The functions F(x) and G(x) are related by (9.71) and (9.72) to the linear polarization components parallel and perpendicular to the magnetic field, the frequency (9.75) is normalized by (9.76)

F(x) and G(x)

Table 9.1. Spectral Distribution of the emission from a charged particle moving in a magnetic field

x	F(x)	G(x)	p	x	F(x)	G(x)	p
0.00	0.0000	0.0000	0.500	1.00	0.6514	0.4945	0.759
0.01	0.4450	0.2310	0.519	1.10	0.6075	0.4669	0.769
0.02	0.5472	0.2900	0.530	1.20	0.5653	0.4394	0.777
0.03	0.6136	0.3305	0.539	1.30	0.5250	0.4123	0.785
0.04	0.6628	0.3621	0.546	1.40	0.4867	0.3859	0.793
0.05	0.7016	0.3881	0.553	1.50	0.4506	0.3604	0.800
0.06	0.7332	0.4102	0.560	1.60	0.4167	0.3359	0.806
0.07	0.7597	0.4295	0.565	1.70	0.3849	0.3125	0.812
0.08	0.7822	0.4465	0.571	1.80	0.3551	0.2904	0.818
0.09	0.8015	0.4617	0.576	1.90	0.3274	0.2694	0.823
0.10	0.8182	0.4753	0.581	2.00	0.3016	0.2502	0.829
0.12	0.8454	0.4988	0.590	2.50	0.1981	0.1682	0.849
0.14	0.8662	0.5184	0.598	3.00	0.1286	0.1112	0.865
0.16	0.8822	0.5348	0.606	3.50	0.0827	0.07256	0.877
0.18	0.8943	0.5486	0.613	4.00	0.0528	0.04692	0.888
0.20	0.9034	0.5604	0.620	4.50	0.0336	0.03012	0.897
0.22	0.9099	0.5703	0.627	5.00	0.0213	0.01922	0.904
0.24	0.9143	0.5786	0.633	5.50	0.0134	0.01221	0.910
0.26	0.9169	0.5855	0.639	6.00	0.00837	0.00773	0.916
0.28	0.9179	0.5913	0.644	6.50	0.00530	0.00487	0.920
0.30	0.9177	0.5960	0.649	7.00	0.00332	0.00306	0.923
0.40	0.9019	0.6069	0.673	7.50	0.002076	0.00192	0.926
0.50	0.8708	0.6030	0.692	8.00	0.001298	0.00120	0.927
0.60	0.8315	0.5897	0.709	8.50	0.000812	0.000752	0.926
0.70	0.7879	0.5703	0.724	9.00	0.000507	0.000469	0.924
0.80	0.7424	0.5471	0.737	9.50	0.0003177	0.0002920	0.919
0.90	0.6966	0.5214	0.749	10.0	0.0001992	0.0001816	0.912

its maximum, value, of 0.0181