SIZE DISTRIBUTION OF ASTEORIDS F. Yoshida, National Astronomical Observatory of Japan, 2-21-1 Osawa, Mitaka, Tokyo 181-8588 (fumi.yoshida@nao.ac.jp)

Introduction: The size, spatial, and compositional distributions of Main Belt Asteroids (MBAs) have been believed to reflect a long-term history of collisional evolution in the main asteroid belt (e.g., [1]). Good knowledge of the size distribution of MBAs allows us to gain insight into collisional process of MBAs, production rate of Near-Earth Asteroids (NEAs) and meteorites, cratering rate on the surfaces of the inner planets or asteroids, impact strengths of asteroids, and so on. It may also provide information about the accretion process of planetesimals in the main belt during the initial stage of our solar system. The original mass of the main belt may also be determined (e.g. [2-4]).

From such motivations, several systematic surveys, as summarized in Table 1, have so far been carried out, and the size distributions of MBAs have been revealed down to a few hundred meters in diameter (D).

In this presentation, the size distribution of MBAs obtained so far will be shown and then be compared with those of NEAs, Jupiter Trojans, and other small solar system bodies.

In ACM2012, Souami D. et al. (SMBAS2002) also present the results from a series of SMBAS (Sub-km Main Belt Asteroids Survey), which are including the size distribution of MBAs.

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Table 1 Major asteroid surveys and the size distributions of MBAs.

Survey	Limiting mag.	Area (deg^2)	Detected Asteroids	Slopes (b), D (km)
YMS[2] (1950-52)	V_p<14-16	14400	1550	2.4 (30<D< 300)
PLS[5] (1960)	V_p<20-21	216	>2000	1.8 (D>5)
Spacwatch [4] (1992-95)	V<21	3740	59226	1.8 (D>5)
SDSS[6] (1998-2000)	r*< 21.5	500	13000	3 (5<D<40) 1.3 (0.4<D<5)
SMBAS 2000[7]	V< 23.8	0.20	27	1.0+/-0.3 (1<D<6)
SMBAS 2001a[8,9]	R< 24.4	2.97	861	1.19+/0.02 (0.5<D<1)
SMBAS 2001b[10]	R< 24.2	4.08	1001	1.29+/-0.02 (0.6<D<1)
SMBAS 2001c[11,12]	R< 24.6	0.26	76	1.47+/-0.05 (0.3<D<1)
SMBAS2002		Souami D. et al.		
SMBAS2004		Tai C. Y. et al.		
SMBAS 2009[13]	R< 24.5	0.48	250	1.42 (0.5<D<1)
SMBAS 2010[13]	R< 24.5	0.81	366	1.45 (0.5<D<1)
SKDAS (2001)[14]	R<23.5	8.4	1277	1.50+/-0.10 (1<D<4)
WISE (2010)[15]	-	All-sky	129750	Consistent with Gradman et al. [14]

Vp : photographic magnitude.
Slopes (b) : the power-law index (b) in equation : $N(>D) \propto D^{-b}$, corresponding to the slope of the log N vs. log D plot.