Measurement of Interplanetary and Interstellar Dust Particles by Mars Dust Counter (MDC)

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Mars Dust Counter (MDC) is a light-weight dust detector of impact ionization type on board Japanese Mars mission NOZOMI. NOZOMI was launched on July 4th (3rd at UT) 1998. From December 1998 to December 2003 for five years, NOZOMI takes eccentric orbits between orbits of the Earth and Mars. Until April 2002, MDC continuously observed interplanetary dust. MDC has detected nearly 100 doubtless dust impacts. There were observed several high velocity particles, which are apparently different from Keplerian dust particles gravitationally bound to the sun. Directional analysis showed that MDC has detected several particles of interstellar origin especially in 1999.

From July 2001 to April 2002, MDC has detected 14 impacts with velocity and mass determination. Most of dust trajectories can be interpreted by Keplerian dust particles. There is no evidence of interstellar dust particles, although most of detection zone was within the region where more frequent detection of interstellar particle was expected.

There is suggested a possibility that interstellar dust flux could be changed according to the condition of interplanetary magnetic fields. However, the difference between 1999 data and 2000-2002 data does not necessarily mean the change of interstellar dust flow. It could be also explained by the change of dust detection efficiency according to NOZOMI spin axis direction.