

PEM035-13

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## Plasma observation around the Moon by SELENE(KAGUYA) MAP-PACE

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KAGUYA is a Japanese lunar orbiter which was launched on 14 September 2007 from Tanegashima Space Center in Japan. The satellite is a polar orbiter, the orbit altitude of which is 100 km. The orbit plane moves west by 1.1 degrees per orbit in longitude. MAP is one of the scientific instruments onboard SELENE. MAP consists of LMAG (Lunar MAGnetometer) and PACE. LMAG is a triaxial flux gate magnetometer that is equipped at the top plate of a 12-m long mast in order to reduce an offset of the interference magnetic fields caused by the spacecraft. LMAG measures the vector magnetic field with a sampling frequency of 32 Hz and a resolution of 0.1 nT. PACE consists of four sensors: ESA (Electron Spectrum Analyzer)-S1, ESA-S2, IMA (Ion Mass Analyzer) and IEA (Ion Energy Analyzer). ESA-S1 and S2 measure the distribution function of low-energy electrons below 15 keV, while IMA and IEA measure the distribution function of low-energy ions below 28 keV/q. KAGUYA is a three-axis stabilized satellite. ESA-S1 and IMA continuously face to the Moon and measure anti-moonward electrons and ions, while ESA-S2 and IEA are mounted on the opposite side of the satellite and measure moonward electrons and ions. Each sensor has a hemispherical field of view. Three-dimensional distribution functions of electrons and ions are measured by a pair of electron sensors (ESA-S1 and S2) and a pair of ion sensors (IMA and IEA), respectively. SW ions are measured by IEA on the dayside when the Moon is exposed to the SW. IMA measures the SW only around the day-night terminator. One of the main roles of IMA is to measure ions coming from the Moon and to identify the ion species by mass analysis. We will report the instrumentation of the MAP-PACE on KAGUYA, the observation results and other instruments for the future planetary missions.

Keywords: Plasma, Energy analysis, Mass analysis, Moon