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## The space particle instrument calibration facility at PSSC/NCKU and development of a neutral particle analyzer

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The Plasma and Space Science Center (PSSC) Space Instrument Laboratory developed a test and calibration facility for space plasma instrument development. With a high-energy ion beam (1 -130 keV) and 3-axis turntable, the facility is capable of calibrating particle analyzers that can measure 3-dimensional velocity distributions with a wide energy range. The ion beam is produced by electron impact on neutral gas introduced to the ion source chamber and ions with a specific mass/charge value are selected by the ExB mass spectrometer. After the beam expander, the ion beam is accelerated by an electric potential drop in the accelerator tube and directed to the drift tube where a beam monitor is located. In the main chamber the 3-axis turntable is set up to house particle instruments for test and calibration. The property of the ion beams will be presented. One of the space particle instruments we are developing using this facility is a Neutral Particle Analyzer (NPA), which is one of the instruments for a sounding rocket experiment to observe the ionosphere and thermosphere. The NPA measures the neutral energy distribution function as neutral particles enter into the instrument as the rocket proceeds. Then, neutral particles are ionized by an electron beam and accelerated by a uniform electric field perpendicular to the incident velocity towards the detector plane. Only the particles with an incident energy selected by the acceleration electric field can reach one of the two detectors through a slit in the detector plane. By sweeping the electric field strength, the full energy spectrum is obtained. Test results of the NPA will be presented.

キーワード: space instrument, instrument development facility, neutral particle analyzer

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