Development of EUV detector for BepiColombo mission

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Mariner-10 UV measurements and telescopic optical spectroscopy from Earth identified six elements (Ca, Na, K, H, He, and O) in the vicinity of the Mercury. Other species are expected e.g. H2, OH, and some noble gasses (Ar, Ne, and Xe). All species representative of the surface composition, directly produced by impact vaporization driven by micrometeoroids, physical sputtering, photo-stimulated desorption, and thermal desorption from the regolith should also be present. To bring out the composition of Mercury atmosphere more properly, the PHEBUS (Probing Of Hermean Exosphere By Ultraviolet Spectroscopy) instrument on Mercury planetary orbiter (MPO) will explore Mercury. PHEBUS is a dual FUV-EUV spectrometer working in the wavelength range from 30 to 330 nm. It uses up-to-date technologies to achieve minimum mass (3.7 kg) and power (3.3 W). A consortium composed of three main partners implements it. Japan will provide the detectors and the main entrance mirror, IKI (Russia) will implement the scanning system, and SA/IPSL (France) will take in charge the design, assembly/ test/ integration, and also provide three small detectors (zero order monitor, Ca and K channels).

We are now developing compact detector system sensitive to EUV airglow emissions of Mercury. As development subjects of the detector system, we are working at micro channel plates (MCPs) as a high-sensitive detector for EUV airglow emissions, resistive anode encoder as a position sensitive anode, and vacuum device to keep the detector system from performance degradation until launch. In our presentation we report these subjects totally.