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# Selection of new innovation crystal for Mercury Gamma-ray and Neutron Spectrometer on-board MPO/BepiColombo mission.

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The Mercury Gamma-ray and Neutron Spectrometer (MGNS) was developed in Space Research Institute for detection the flux of neutron and gamma-ray from the Mercury subsurface on-board Mercury Polar Orbiter of ESA BepiColombo mission. The instrument consists of $^{3}$He proportional counters and organic scintillator for detection of neutron and also gamma-spectrometer based on scintillation crystal for detection of gamma-ray. For the gamma-ray spectrometer the $LaBr_3$ crystal was selected, the best choice at the time of the instrument proposal in 2004. However, quite recently the European industry has developed the new crystal $CeBr_3$, which could be much better than $LaBr_3$ crystal for planetology. Such crystal with the necessary size of 3 inch became available in the stage of manufactory of Flight Spare Module of MGNS instrument. New $CeBr_3$ crystal has much better signal-to-noise ratio than $LaBr_3$ crystal in the energy band up to 3 MeV. Also, in the $LaBr_3$ crystal, the important for planetology gamma-ray line of potassium at 1461 keV is overlapping with the background gamma-ray line of $^{138}$La isotope at 1473 keV. This $CeBr_3$ crystal was integrated to MGNS instrument. We present the results of gamma-ray performance and environment tests of MGNS with $CeBr_3$ crystal, and also comparison between $LaBr_3$ and new $CeBr_3$ crystals in context of space application for this instrument.