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Discovery of 1 Hz quasi-periodic oscillations in an RXTE observation of MAXI J1543-564

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We report on an RXTE follow-up observation of the ongoing outburst of the newly discovered transient X-ray source MAXI J1543-564 (ATELs #3330 and #3331). At ~2:08 UT on May 10th, 2011, RXTE observed MAXI J1543-564 for about 800 seconds (only PCU2 was active). The 2-60 keV power spectrum of this observation exhibits only a single ~10 sigma quasi-periodic oscillation at a frequency of 1.05+-0.02 Hz. Its FWHM and fractional rms amplitude are 0.5+-0.1 Hz and 22+-1%, respectively.

Assuming a Galactic absorption of 0.9e22 cm-2 (as reported from Swift/XRT analysis, ATEL #3331), we find that the 3-25 keV PCA spectrum of the source is well described (chi2/dof = 46.06/46) by an absorbed powerlaw+gaussian model with a photon index of 1.8+-0.2 (at a 90% confidence level). The 2-25 keV absorbed flux is ~8e-10 ergs/s/cm2. The energy of the gaussian needed was fixed to 6.5 keV; this component was required at a ~3.6 sigma level as estimated by an F-test. Its equivalent width is ~140 eV.

To compare with the Swift/XRT observation of May 8th (ATEL #3331), we extrapolated this model fit to lower energies. We estimate a 0.3-10 keV flux of ~5.5e-10 erg/s/cm2, or 9.6e-10 erg/s/cm2 when corrected for absorption. These values are between 25 and 50 % higher than on May 8th, indicating that the source is still brightening. The 1.80+-0.2 photon index we find is consistent within ~2 sigma level to that reported in ATEL #3331.

The energy spectrum and X-ray variability of MAXI J1543-564 do not give yet conclusive evidence for the nature of the source (whether it is a black hole or a neutron star) and hence follow-up observations of the ongoing outburst are strongly encouraged.

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