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The Quiescent Optical Counterpart to Swift J174510.8-262411

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*on **24 Sep 2012; 16:20 UT***
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Subjects: Infra-Red, Optical, Binary, Black Hole, Transient

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The new transient Swift J174510.8-262411 (Cummings et al. 2012, GCN#13744; Cummings et al. 2012, GCN #13745) is within the field of the Galactic Bulge Survey (Jonker et al. 2011, ApJS, 194, 18) and was observed twice with Chandra/ACIS-I on 2008 May 16 and 17, for 2 ks each. The source was not detected in either image to the survey limit of 7.7e-14 erg/cm^2/s (0.3-8.0 keV).

Optical imaging of the field in the SDSS r' filter was obtained from 2010 July 9-16 using the CTIO 4m Blanco telescope and Mosaic-2 camera. We examined an average of the six highest quality images totalling 720 sec of exposure obtained in seeing 1.0-1.2 arcsec to search for the quiescent counterpart to the IR source identified by Rau et al. (ATEL#4380) and supported spectroscopically by de Ugarte Postigo et al. (ATEL#4388). We do not detect the counterpart in our images. We estimate the 90% confidence limit on a detection as r'>23.1+/-0.5, where the uncertainty reflects that in the pipeline calibration of the photometry relative to USNO B1.0 stars in the field.

Rao et al. estimated the J-band counterpart brightened by approximately three magnitudes to J=16.5+/-0.5, so our non-detection suggests a quiescent color of r'-J > 3.6+/-0.7. Using the VVV reddening maps of the Galactic bulge (Gonzalez et al. 2012, A&A, 543, A13) we expect E(r'-J) = 3.3+/-0.4. Our non-detection is thus consistent with typical red colors of quiescent low-mass X-ray binaries and indicates that optical follow-up of the quiescent counterpart will be extremely difficult.

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