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The spin-down of Swift J1834.9-0846: confirmation as magnetar

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The spin-down of Swift J1834.9-0846: confirmation as magnetar

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on 23 Aug 2011; 12:24 UT

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Subjects: X-ray, Gamma Ray, Neutron Star, Soft Gamma-ray Repeater, Transient, Pulsar

Referred to by ATel #: [3600](#)

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Data from monitoring observations with RXTE PCA and Swift XRT of Swift J1834.9-0846 (GRB110807A) covering a time span of about 2 weeks (MJD 55782-55795) since its discovery on August 7, 2011 (GCN #[12253](#); GCN #[12255](#)) have been used to construct an accurate phase-coherent timing solution using barycentered (see GCN #[12253](#) for the source position) pulse arrival times (ToA's) obtained by cross-correlation with a pulse-profile template.

Fitting two frequency parameters to the TOA set (5 XRT/3 PCA observations) we obtained, $\nu = 0.40285190(8)$ Hz, consistent with the value derived by Gogus (ATEL #[3542](#)), and $d\nu/dt = -1.3(2)E-12$ Hz/s for Epoch 55783.0 MJD (TDB timescale).

Adopting the canonical magnetic-dipole braking model the estimated surface polar magnetic field is $1.4E14$ Gauss, well above the quantum critical value of $4.413E13$ Gauss, and thus confirming the magnetar nature of Swift J1834.9-0846. The characteristic time scale (age) is 4960 year.

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