Erratum: Evidence for an intermediate-mass black hole in the globular cluster NGC 6624

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Monthly Notices
of the
ROYAL ASTRONOMICAL SOCIETY

MNRAS **471,** 1258 (2017)
Advance Access publication 2017 May 19

doi:10.1093/mnras/stx1236

Erratum: Evidence for an intermediate-mass black hole in the globular cluster NGC 6624

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Key words: errata, addenda – black hole physics – stars: neutron – pulsars: individual: PSR B1820–30A – globular clusters: individual: NGC 6624.

The paper 'Evidence for an intermediate-mass black hole in the globular cluster NGC 6624' was published in MNRAS, 468, 2114 (2017).

When estimating the model-dependent minimum mass of the intermediate-mass black hole (IMBH) of 60 000 $M_\odot$ in Section 5, we used the separation of 0.15 pc for PSR J1823−3021C from the globular cluster centre, as given in Peuten et al. (2014, see table 2 therein). Unfortunately, this value is incorrect and the correct separation is 0.34 pc based on the position given in Table 1 (also see Lynch et al. 2012). This correct distance measurement changes the result presented in Fig. 9 in the published version, and the modified figure based on the positions given in Table 1 is appended here. Note that this does not affect any other results presented in the paper, in particular, the IMBH mass estimation obtained through orbital dynamics given in Section 4.

If the measured accelerations (i.e. $\dot{P}/P$) of PSRs J1823−3021B and C are assumed to be solely dynamically induced and the intrinsic spin-down contribution is negligible (see equation 1), then the required mass of the IMBH to explain the acceleration of these sources becomes as massive as the cluster mass. This implies that the intrinsic spin-down of these two pulsars is important and their dynamically induced accelerations are smaller than the measured accelerations. Therefore, we exclude these two pulsars in the estimation of the IMBH mass limit in Section 5. Assuming that the dynamically induced acceleration of the low-mass X-ray binary (LMXB) is approximately equal to the observed value, as used in Peuten et al. (2014), we estimate that the minimum model-dependent mass of the IMBH is ∼20 000 $M_\odot$. Thus, the ∼60 000 $M_\odot$ mass limit mentioned in Section 5 and in the Abstract in the published version has to be replaced by this correct model-dependent mass limit of ∼20 000 $M_\odot$. We also note that the mass of the IMBH used to produce Fig. 8 was 19 000 $M_\odot$ and this mass is approximately equal to the correct mass limit given above. Therefore, the result presented in Fig. 8 in the published version is valid.

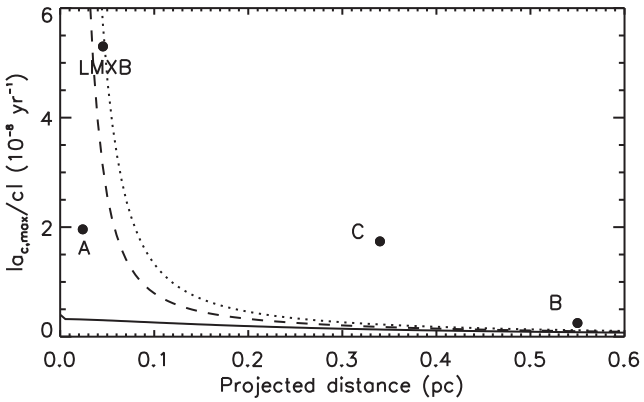

Figure 9. Cluster model predicted maximum acceleration as a function of projected distance from the centre (calculated from Table 1). Different curves represent the acceleration for different IMBH masses in the centre: no IMBH (solid), 10 000 $M_\odot$ (dashed) and 20 000 $M_\odot$ (dotted). The measured accelerations of PSRs B1820−30A, B1820−30B and B1820−30C, and the LMXB 4U 1820−30 are marked appropriately. To be consistent with the measured acceleration of PSR B1820−30A and the LMXB, the cluster model requires the minimum mass of the central IMBH to be 20 000 $M_\odot$.

ACKNOWLEDGEMENTS

We thank Mark Gieles and Federico Abbate for noticing this error in the separation of pulsar C used in the published version.

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