Cornell University Library

We gratefully acknowledge support from the Simons Foundation and member institutions

arXiv.org > astro-ph > arXiv:1107.5056

Search or Article-id

(Help | Advanced search)

All papers | Go!

Astrophysics > Galaxy Astrophysics

The final parsec problem: aligning a binary with an external accretion disc

Chris Nixon, Andrew King, Jim Pringle

(Submitted on 25 Jul 2011)

We consider the interaction between a binary system (e.g. two supermassive black holes or two stars) and an external accretion disc with misaligned angular momentum. This situation occurs in galaxy merger events involving supermassive black holes, and in the formation of stellar--mass binaries in star clusters. We work out the gravitational torque between the binary and disc, and show that their angular momenta J_b, J_d stably counteralign if their initial orientation is sufficiently retrograde, specifically if the angle theta between them obeys $\cos(\theta) < -J_d/2J_b$, on a time short compared with the mass gain time of the central accretor(s). The magnitude J_b remains unchanged in this process. Counteralignment can promote the rapid merger of supermassive black hole binaries, and possibly the formation of coplanar but retrograde planets around stars in binary systems.

Submission history

From: Christopher Nixon [view email]

[v1] Mon, 25 Jul 2011 20:03:33 GMT (92kb)

Which authors of this paper are endorsers?

Link back to: arXiv, form interface, contact.

Download:

- PDF
- PostScript
- Other formats

Current browse context:

astro-ph.GA

< prev | **next >**

new | recent | 1107

Change to browse by:

astro-ph
  astro-ph.CO
  astro-ph.HE

References & Citations

- INSPIRE HEP
  (refers to | cited by)
- NASA ADS

Bookmark(what is this?)