

DYNAMICS OF MASSIVE BLACK HOLES IN THE CENTER OF INTERACTING GALAXIES

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Our numerical tool is SUPERBOX (Bien et al., 1991) which can treat an arbitrary number of galaxies. Simulations including Black Holes are important to understand recent observations, see e. g. Mediavilla and Arribas (1993).

In our opinion, Black Holes should represent regions of highest activity before and after an interaction or merging. We expect that the position of the Black Hole does not necessarily coincide with regions of highest stellar density after an interaction. Possibly this allows us to estimate the efficiency and duration of interactions.

From our whole material we propose the following interpretation. A large impact parameter causes a small offset, i. e. the distance between a Black Hole and the central density. After about 20 Myr the Black Hole falls back to the center of the parent galaxy. When the impact parameter is small the offset is 200 – 500 pc and the time-scale is 30 – 40 Myr. In other words: when the interacting partners are well separated, the offset has already disappeared. We expect a long-lasting offset when the two galaxies are merging. The scattering of a Black Hole is mainly caused by the core of the disturbing partner. A massive Black Hole falls into the center quite rapidly. If the collision is head-on both Black Holes can be expelled.

References

- Bien, R., Fuchs, B., Wielen, R.: 1991, Proc. CP90 Europhys. Conf. Phys.
Mediavilla, R., Arribas, S.: 1993, Nature, vol. 365