

J1048+7143: A Supermassive Black Hole Binary Candidate*

Coincident quasi-periodic oscillations are observed in the gamma-ray, optical and radio light curves from the blazar J1048+7143. While in gamma rays and optical, the flares consist of two subflares each, the radio emissions show a Gaussian-like flare structure.

Here, we show that all these flares are consistent with a supermassive binary black hole at the center of this blazar, caused by the spin-orbit coupling of the leading jet.

A jet precession model is presented, with which we successfully predicted the timing of the flare observed between 2022 and 2024. With this model, we constrained the mass ratio of the binary, allowing predictions of when it will merge. Finally, we model the characteristic strain of its expected gravitational wave emission.

*Supported by DFG (MICRO and SFB 1491)

Affiliation

CEA/IRFU/DPHP

Auteur principal: JAROSCHEWSKI, Ilja (CEA/IRFU/DPHP)

Co-auteurs: KUN, Emma (Ruhr University Bochum); BECKER TJUS, Julia (Ruhr University Bochum); BRITZEN, Silke (Max-Panck-Institut für Radioastronomie)