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A new look at old devils: imaging classical radio galaxies with MeerKAT and uGMRT

Abstract

46 years have passed since the publication of the paper The morphology of extragalactic radio sources of high and low luminosity, Fanaroff & Riley, 1974, MNRAS 167, 31. That paper, with a citation record higher than 2000, has set the basis for the study of extragalactic radio sources, whose classification in FRI and FRIII types is still used to separate low power and high power radio galaxies respectively.
Our understanding of extragalactic radio sources has improved considerably over the past half century, however the much improved capabilities of the current radio interferometers, i.e. LOFAR, JVLA, uGMRT and MeerKAT are considerably challenging our knowledge, putting forward new questions, related both to the origin and evolution of radio galaxies and to the role of the interaction with the external medium in shaping their properties.
With the main goals to test whether the morphological classification scheme of radio galaxies still holds with the current imaging capabilities, and how classical radio galaxies look like at the microJy sensitivity that the combination of MeerKAT and uGMRT offers in the frequency range 500-1800 MHz over a broad range of angular resolutions (from few arcsec to tens of arcsec), we selected a sample of FRI and FRII radio galaxies and started a project with both interferometers. We were allocated observing time with MeerKAT and uGMRT to image a first set of radio galaxies. With the present proposal we ask to observe 6 more sources in our sample, for a total request of 30 hours of MeerKAT time.