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Hotspots as particle acceleration laboratories in the perspective of SKA

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Hotspots are bright and compact regions at the edge of powerful radio galaxies which represent the working surface of the supersonic jets produced by an AGN. Their radio to X-ray synchrotron emission proves that particle acceleration is highly efficient in shocks developing hundred-kpc away from the central engine, with particles accelerated to Lorentz factors $>10^6-10^7$. Moreover, the detection of diffuse optical emission, points to a role of turbulence in re-accelerating particles in the back-flowing plasma. As such, hotspots are excellent laboratories to investigate different mechanisms of particle acceleration. First, I will present the results of our effort to probe the geometry of the hotspot regions and magnetic field configuration, based on JVLA multi-frequency (300 MHz-20 GHz) observations. Then I will discuss progress possible thanks to the huge improvement in sensitivity and angular resolution in the MHz regime of SKA.

Research area

Extragalactic Continuum (galaxies/AGN, galaxy clusters)

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