

# Radio continuum and HI 21-cm line emission from M51 analogs observed with SKA

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Atomic hydrogen (HI), a component of galactic gas, is essential to many astrophysical processes. In particular, mapping the HI atomic gas in and around galaxies is crucial to explore the physical conditions under which massive star formation is quenched throughout cosmic time and to analyze the feeding and feedback scenario in the traditional models of galaxy history. Sensitive SKA observations provide the first practical chance to investigate the untouched topic of HI in galaxies at higher redshifts. We simulate the HI maps of high- $z$  galaxies whose present-day HI emission characteristics and SFR are like those of nearby galaxies such as M51. To further investigate the potential of proposed surveys in mapping HI in this galaxy at high- $z$ , the simulations adopt the SKA configurations and sensitivities. Additionally, the study also simulates the evolution of thermal and non-thermal radio continuum (RC) emission on kpc scales within the redshift range of  $0.15 < z < 3$ . The objectives of this research are to examine: a) the structures of thermal and non-thermal emission on kpc scales, b) the evolution of the thermal fraction and synchrotron spectrum at mid-radio frequencies, and c) the capability of the SKA1-MID reference survey in detecting RC emitting structures.

## keywords

Simulation for SKA, HI, Radio Continuum

## In-person or online?

in-person

## Career level

ECR

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**Session Classification:** Poster Sparklers