



ID de Contribution: 36

Type: Oral presentation

Detection of interstellar radio recombination lines with NenuFAR

jeudi 29 février 2024 12:15 (15 minutes)

We report detection of the low frequency carbon radio recombination lines (RRLs) towards several galactic radio sources using the NenuFAR array. Based at Nançay Radio astronomy station, NenuFAR (New Extension in Nançay Upgrading LOFAR) is a LOFAR extension and SKA precursor that can detect Carbon atoms at quantum numbers between $n = 400$ and $n = 850$, thanks to its frequency range spanning from 10 MHz to 85 MHz. Observations were carried out in the period from 2021 to 2023 both for the directions where low frequency RRLs were already observed (Cassiopeia A, Cygnus A, and Cygnus Loop) and towards new objects. Positive results have been obtained for the directions of Cassiopeia A, Cygnus A, Cygnus Loop, Cygnus X, and Taurus A. The achieved sensitivity corresponds to optical depths less than 0.0005. Strong dependence of the low frequency RRLs parameters on physical conditions in the interstellar medium where they arise makes them an effective probe of the cold partially ionized diffuse gas. Values of features' radial velocities observed towards Cygnus A, Cygnus Loop, Cygnus X, and Taurus A suggest that they arise in the medium connected with Galactic Plane. Well known carbon RRLs towards Cas A arise in the Perseus Arm of the Galaxy. Our Cas A and Cygnus A results are consistent with previously obtained data. All detected RRLs are observed in absorption. Our observations illustrate the promising opportunity of the low frequency RRLs studies with newly installed NenuFAR radio telescope.

Astrophysics Field

InterStellar Medium

Day constraints

Friday afternoon is not possible for me.

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Classification de Session: Session 6