

Coherent Radio Emission as a stellar magnetospheric probe: a case-study of the hot magnetic star HD 142990

Abstract

In this proposal, we aim to investigate how the properties of auroral radio emission emitted by hot magnetic stars are related to their stellar parameters. The motivation behind this project arises from a recent proposition that such emission could become a unique stellar diagnostic that will complement existing stellar diagnostics like the H α emission. The emission mechanism behind is the electron cyclotron maser emission or ECME. We have chosen a hot magnetic star whose rotation and magnetic dipole axes are inclined by $\approx 90^\circ$. Such a star is predicted to have a highly complex plasma distribution in its surroundings which is expected to be reflected as strong frequency dependence in the auroral radio emission properties. The existing wideband observation of this star, spanning narrow rotational phase-ranges, already conform to this idea. Here we propose to observe the star for its one full rotation cycle over the frequency range of the UHF and L band in subarray mode so as to obtain the complete picture of the frequency dependence of ECME for a star with extremely misaligned rotation and magnetic axes. The time requested under this proposal is 26.25 hours including overheads.