Technical Page

Proposal Type:	Short
General Category:	Astronomy
Sub-Category:	Spectroscopy
Observation Category:	Galactic
Total Time Requested:	3 Hours
Minimum Useful Time:	90 minutes

Proposal Title: Neutral Hydrogen Mapping of the Planetary Nebula M27

ABSTRACT:

We propose to acquire a spatial-velocity data cube of the neutral hydrogen distribution in direction of the the planetary nebula M27 with 18×18 point spatial grid covering $(0.5^\circ)^2$ and a velocity resolution of 1 km/s. HI 21 cm observations by the Dwingeloo survey and Lyman series absorption line data from FUSE indicate column densities of $\approx 3 \times 10^{19}$ cm^{-2} are associated with nebular outflow in the velocity interval $\approx 30 - 70$ km/s with respect to the central star. Dwingeloo data can be fit with a nine velocity component model, four components of which can be directly associated with the nebular absorption seen with FUSE. Unfortunately the specifics regarding the nebular velocity distribution is rendered uncertain because of the sparse sampling and large beam size of the Dwingeloo survey. Here we seek to confirm or deny the apparent detection of M27 and the velocity structures implied by the Dwingeloo data. If confirmed this will be the first detection of a PN in the HI 21 cm line. The dense pack of the data cube will yield unprecedented spatial and spectral resolution of the neutral hydrogen remaining in the remnant ejected by the PN progenitor, and provide information on the degree to which this ejecta is clumped. This will further allow for the determination of the neutral hydrogen abundance along with its filling factor, and provide critical constraint to the chemical and kinematic evolution of this object.

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Remote Observing Request

☐	Observer will travel to AO
☐	Remote Observing
☒	In Absentia (instructions to operator)

Instrument Setup

ALFA

Atmospheric Observation Instruments:

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

1418 - 1422