Morpho-kinematical study of the SNR G166.0 +4.3 (VRO)

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Abstract

We present a sample of high-resolution echelle spectra of the VRO (G 166.0+4.3) supernova remnant (SNR), along with the position-velocity (P-V) diagrams and the velocity line profiles reduced from these spectra. For the first time P-V diagrams of an SNR are applied to a morpho-kinematical code (¨SHAPE¨), aiming to reproduce a 3-dimensional structure of the SNR. Here, we present the preliminary results of the SHAPE code showing the P-V diagrams of different filamentary structures of the SNR.
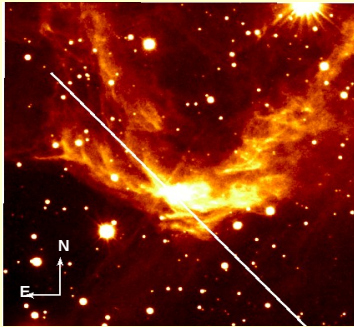
Preliminary Results

Fig.1: High resolution Hα+[N II] image (5'x5') obtained with the 2.3m Aristarchos telescope, where slit position 8 is marked.

Fig.3: High resolution Hα+[N II] image (5'x5') obtained with the 2.3m Aristarchos telescope, where slit position 9 is marked.

Fig.5: Hα image obtained with the 2.3m Aristarchos telescope for slit position 8 showing the first approach to fit five components at the SNR filamentary structures using the SHAPE model.
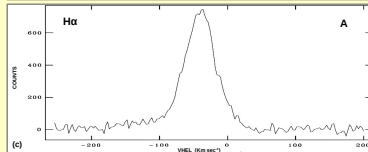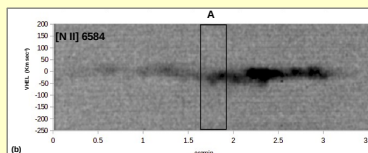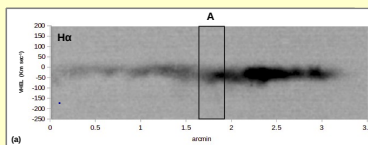

Fig.2: (a),(b): P-V diagrams in Hα and [N II] of slit position 8. Region A was selected due to its high velocity; (c): Hα velocity line profile of region A, where velocities from -100 km/s to 20 km/s where found.
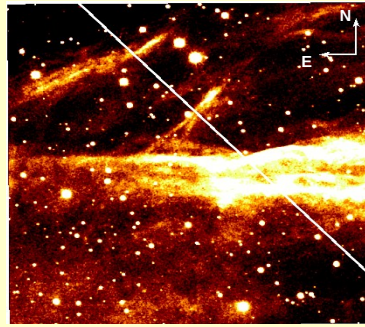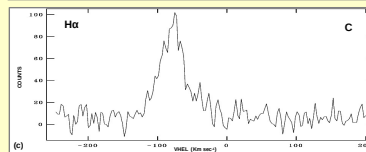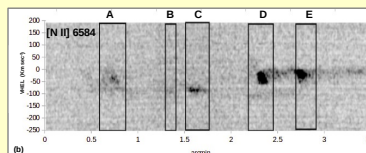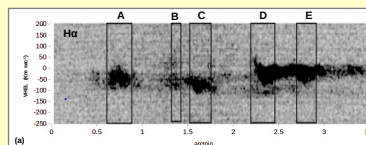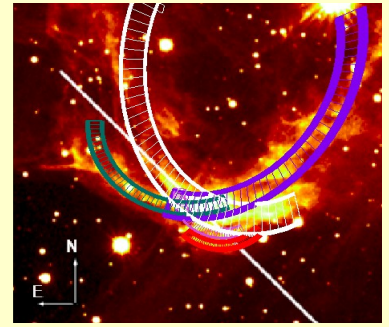

Fig.4: (a),(b): P-V diagrams in Hα and [N II] of slit position 9. Regions A to E were selected due to their peculiar structure and high velocities; (c):Hα velocity line profile of region C, where velocities higher than -100 km/s were measured.
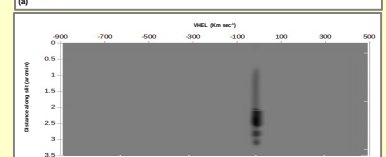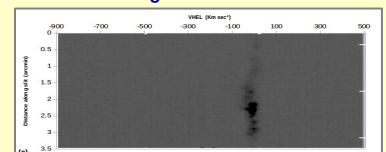

Fig.6: (a): PV diagram of the observed [N II] spectrum for position 8. (b): PV diagram produced by SHAPE for the [N II] spectrum shown in (a), after fitting the 5 different components presented in Fig.5.

Information about the SHAPE code can be found at Steffen et al. 2006; 2011, while, about the VRO SNR and the observations (imaging and spectroscopy) presented here can be found at Boumis et al. 2016 (see also poster by Boumis et al. in this conference).

References

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