



Contribution ID: 116

Type: Oral Presentation

## Tracing water masers at their smallest scale with VLBI

*Tuesday, 5 July 2022 11:45 (15 minutes)*

The recent accretion burst event in the high mass star forming region NGC6334I have given us rare insights into the mechanisms behind the formation of high mass  $> 8M_{\odot}$  stars. An important tracer in the study of star forming regions is astrophysical masers, especially 22 GHz water masers, which have also been studied in NGC6334I. There are still many open questions about water masers, such as the response of water masers in variable radiation environments and their excitation in turbulent shock environments. This study reports multi-epoch high resolution Very Long Baseline Interferometry (VLBI) observations of 22 GHz water masers before and during the accretion burst event in NGC6334I. We report two main results. There was a significant change in water maser spatial morphology with the onset of the burst. These results are helpful in constraining the effect of variable radiation fields on 22 GHz water masers. Secondly, we also identified 35 microstructures with linear sizes of 0.5 – 2.5 AU with Gaussian spectral profiles. These microstructures have been found in other sources as well, and are likely water masers at their smallest scales.

### Apply to be considered for a student ; award (Yes / No)?

Yes

### Level for award;(Hons, MSc, PhD, N/A)?

MSc

**Primary author:** VORSTER, Jakobus (Centre for Space Research)

**Co-authors:** CHIBUEZE, James (N/A); VAN DER WALT, Johan (North-West University); MACLEOD, Gordon (Hartebeesthoek Radio Astronomy Observatory)

**Presenter:** VORSTER, Jakobus (Centre for Space Research)

**Session Classification:** Astrophysics

**Track Classification:** Track D1 - Astrophysics