RADMC3D Models of the Stellar Merger Remnant V838 Mon

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Summary

We have attempted to model the luminous red nova V838 Mon using the radiative transfer code RADMC3D. We tested a wide variety of dust distribution models inspired by the milliarcsecond VLTI-GRAVITY and CHARA-MIRCX images presented in Mobeen et al 2024. From the models we were able to generate synthetic images which allowed us to compute synthetic closure phases and squared visibilities. These were then compared to the observations from 2022. We find our models to be mostly degenerate in explaining the closure phases.
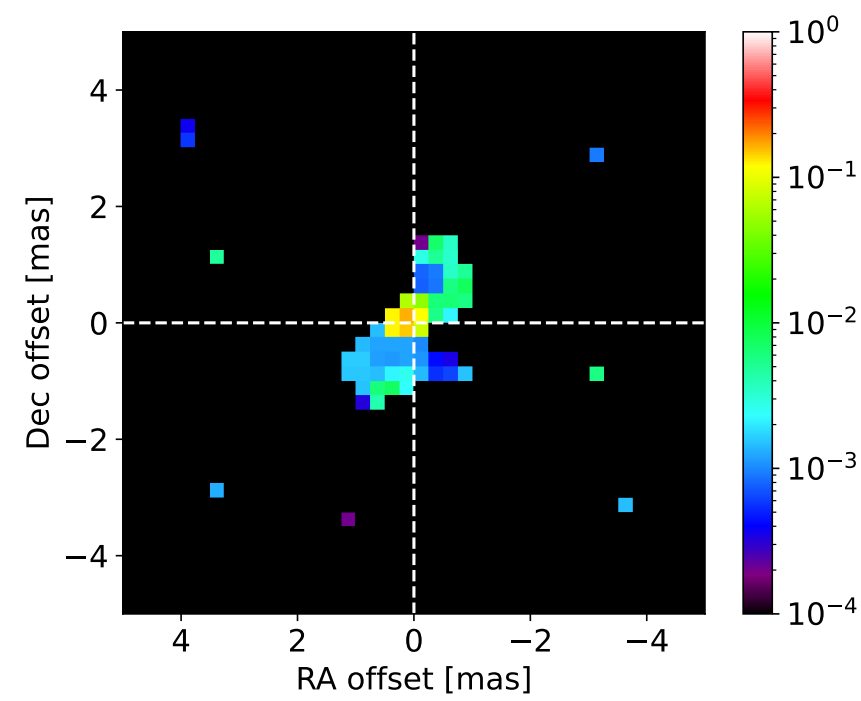
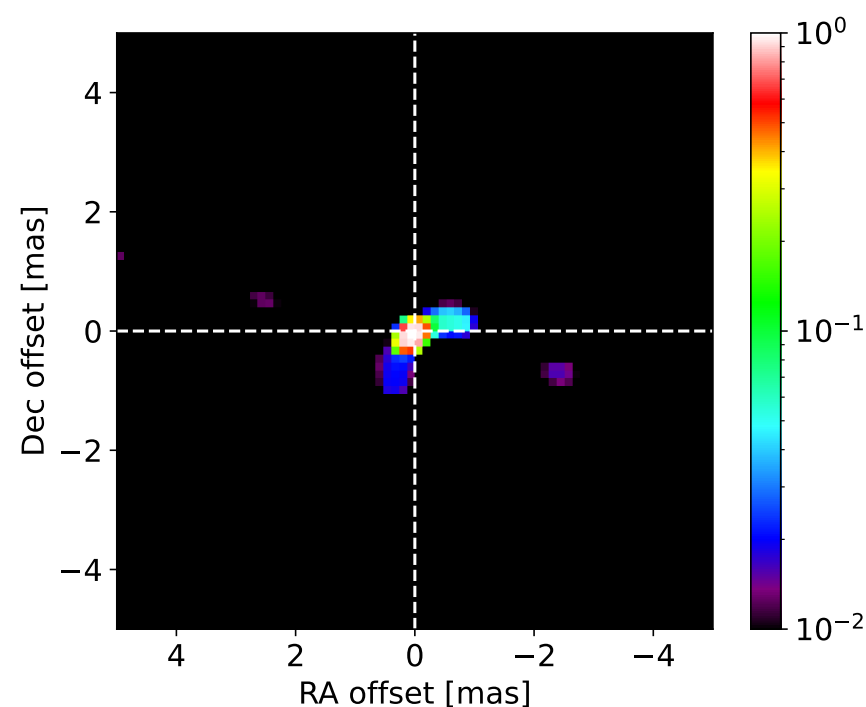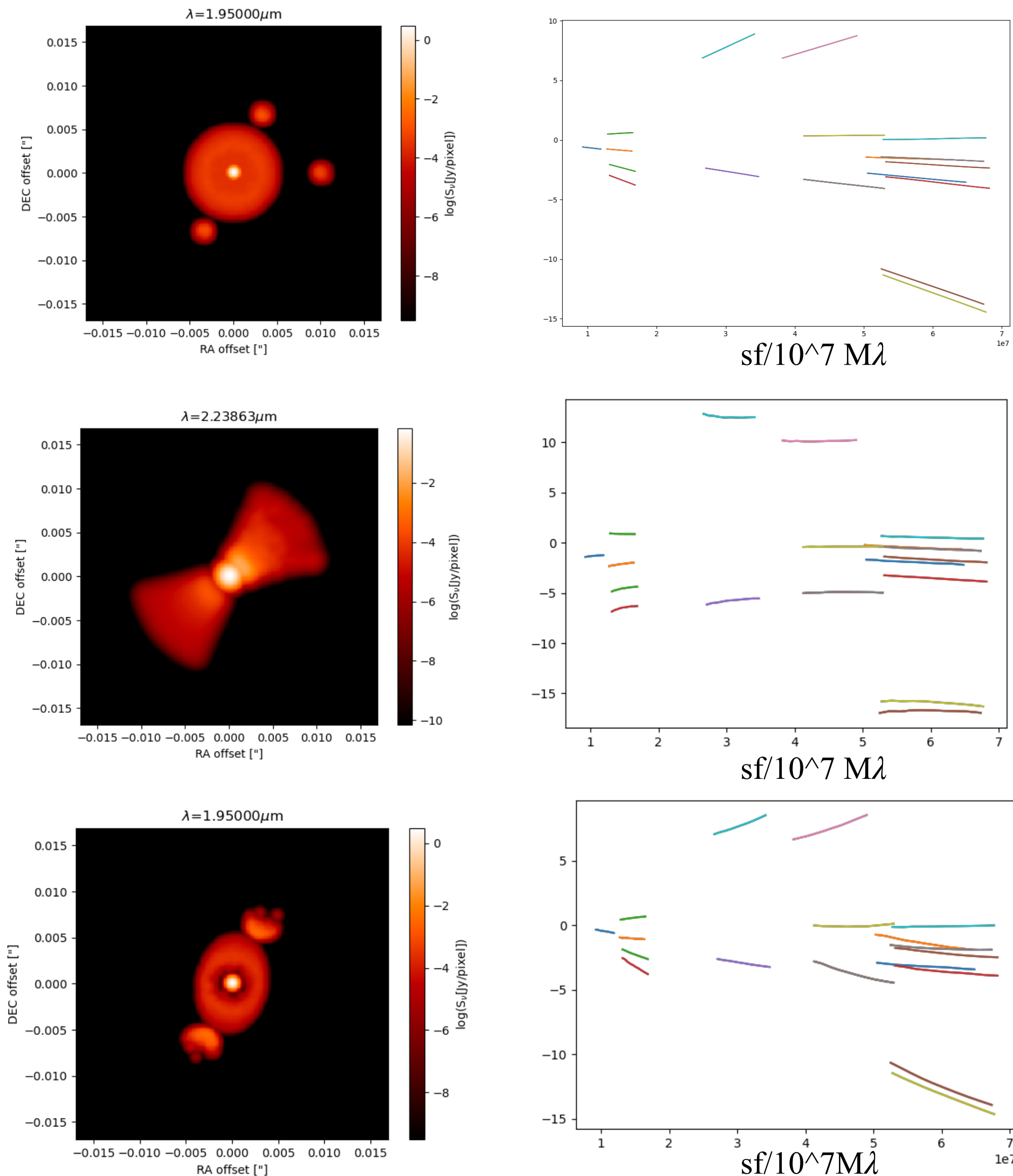## What we know

Fig1: GRAVITY K band image reconstruction.

Fig2: MIRCX H band image reconstruction.

Results

Methods

- RADMC3D for creating dust distributions

- RADMC3DPY library for plotting model images

- Aspro for generating cps and vis2

Conclusions and Future

- Degeneracy in the fit quality for various dust distributions.

- Different configurations only yield minuscule differences in cp's.

- Bi-polar structure more complex than we thought

- Upcoming observations of V838 Mon at Gemini North.

References

Chesneau, O., Millour, F., De Marco, O., et al. 2014, A&A, 569, L3

Mobeen et al 2024 (in review)

Mobeen et al 2021, A&A, 655, A100