

The ArTéMiS submillimeter continuum camera on APEX: Capabilities and first scientific results on the structure of dense star-forming complexes

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ArTéMiS is a new large-format bolometer camera, built by CEA/Saclay, with two focal planes and 10 sub-arrays of 16x18 bolometric pixels operating at 350 μm and 450 μm simultaneously in the Cassegrain cabin of the APEX 12m telescope in Chile [1]. It has been open to proposals from the ESO and OSO communities since 2014. The APEX telescope is itself expected to remain available until at least 2022. ArTéMiS provides an angular resolution of $\sim 8''$ at 350 μm and $\sim 10''$ at 450 μm , comparable to *Herschel*/PACS at 70/100 μm and a factor of 3.5 higher than *Herschel*/SPIRE at 350/500 μm . It can image much wider fields than ALMA and is a factor ≥ 4 faster than the earlier-generation camera SABOCA on APEX.

Following a summary of the instrument capabilities and currently available data reduction tools (including a tailored version of the Scanamorphos software [2]), we will discuss the first results of an on-going long-term project with ArTéMiS to image the structure of the densest molecular gas at < 0.1 pc resolution out to $d \sim 3$ kpc in the Milky Way. This ArTéMiS project is motivated by the findings of *Herschel* imaging surveys of nearby Galactic clouds, which support a filamentary paradigm for solar-type star formation. Our main scientific goals are 1) to investigate whether fragmentation of 0.1-pc wide filaments remains the dominant mode of star formation beyond the Gould Belt, and 2) to clarify whether and how a transition between a “core-fed” and a “clump-fed” regime of protostellar mass growth occurs for intermediate-mass and high-mass star formation. Initial ArTéMiS results on NGC6334 (see [3]), NGC6357, M17, W48, and a few IRDCs will be presented.

References

- [1] Revéret, V., André, Ph., Le Penec, J. et al., SPIE, 9153, id. 915305 (2014)
- [2] Roussel, H., arXiv:1803.04264 (2018)
- [3] André, Ph., Revéret, V., Könyves, V. et al., A&A, 592, A54 (2016)