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**TITLE:** On the significance of polarization of continuous spectrum in modelling of circumstellar dust shells

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**ABSTRACT:**

It can be found in theoretical textbooks that accounting for polarization can be important not only for studying of the precise structure of circumstellar dust shells but also for the temperature distribution within the shell. This is founded on the fact that the polarization specific terms in the radiative transfer equation are of the same order of magnitude as the leading term describing solely the intensity.

We carried out numerical experiments based on Monte Carlo calculations using the computer code RADMC 3D (release 2.0, C.Dullemond 2022). The models considered included spherical silicate dust particles of radius around 0.1  $\mu\text{m}$ , and the optical depths of the models were on the order of 1 to 5 in the visible domain. A single central star was the primary source of energy. We compared two cases for each model: i) polarization is fully accounted for during the process of scattering of radiation, ii) polarization is ignored, and the tabulated phase function is used. The conclusion is that the difference of the modelled dust temperature is small to negligible. So, while polarization of the spectral continuum radiation is very important to reveal the structure and morphology of the envelope, its importance for e.g., astrochemistry is small if any.