Investigating scattering by the impact induced ejecta curtain using the grid of its radiative transfer models

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One of the ways to understand the formation and evolution of dust grains in the solar system is through the study of impacts. Impact cratering of celestial bodies produces ejecta curtains that include the underground material excavated from crater cavities and form inverted conical so called ejecta cone. Therefore, studies of ejecta curtains help us in understanding the size distribution of subsurface grains and the surface evolution. As the in-situ measurements of ejecta curtains from planetary bodies are unavailable in most of the cases, we could use the already available observations, such as the images taken at the Hayabusa2's impact experiment, together with Monte-Carlo radiative transfer models to constrain the size and composition of less-processed grains in the underneath regolith layers of planetary bodies. Here we analyze how the predicted scattered intensities of the ejecta curtain are sensitive to different compositions, sizes and phase function of grains composing the ejecta curtain. In our model, the density of the ejecta curtain is assumed to decrease from the base to the upward direction of an ejecta cone. Further the phase function is compared with the often used Henyey-Greenstein(HG) phase function. We find that the composition and sizes of the grains play a significant role in studying the scattering by ejecta curtain formed. This study will enable us to gain useful insights into the evolution of planetary bodies.