



Constraining Regolith for Near-Earth Asteroid 2021 PDC

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2021 PDC



Size

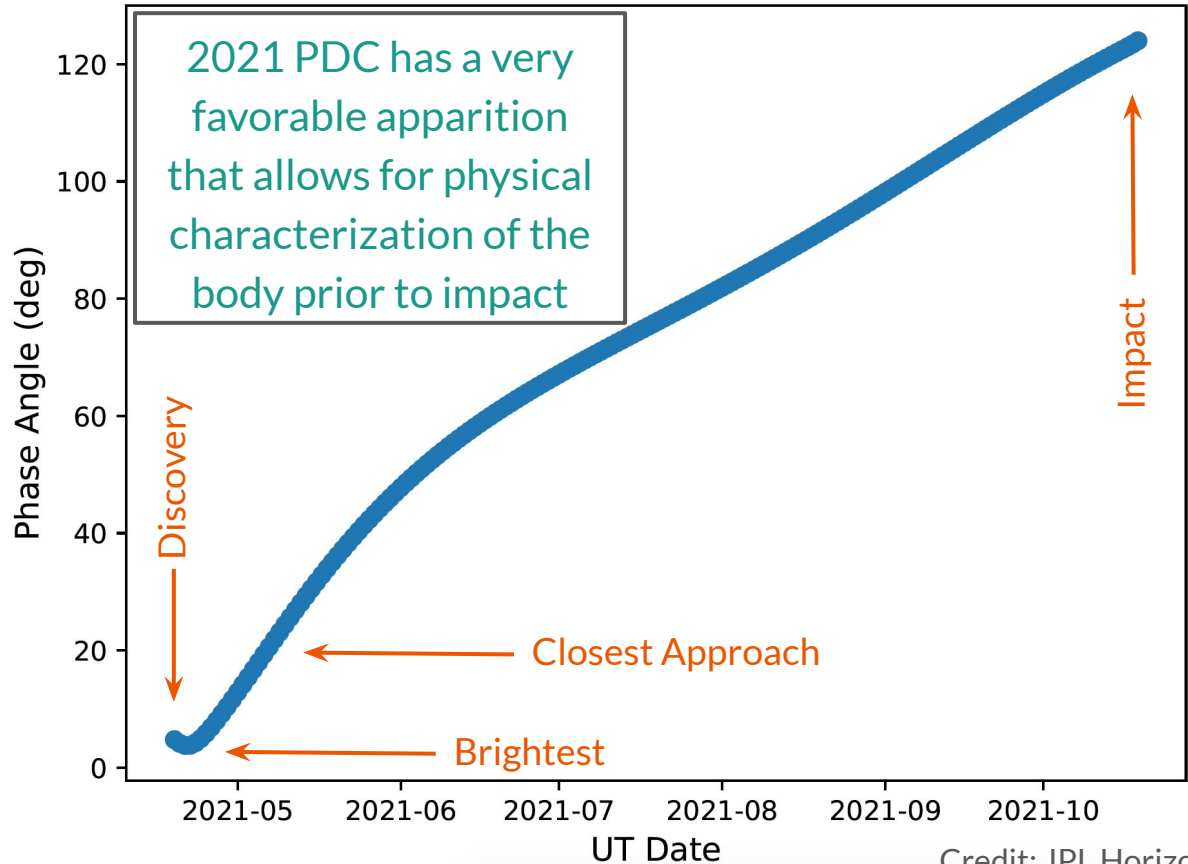
Albedo

Shape

Composition

Surface Properties

Density



Credit: JPL Horizons

2021 PDC



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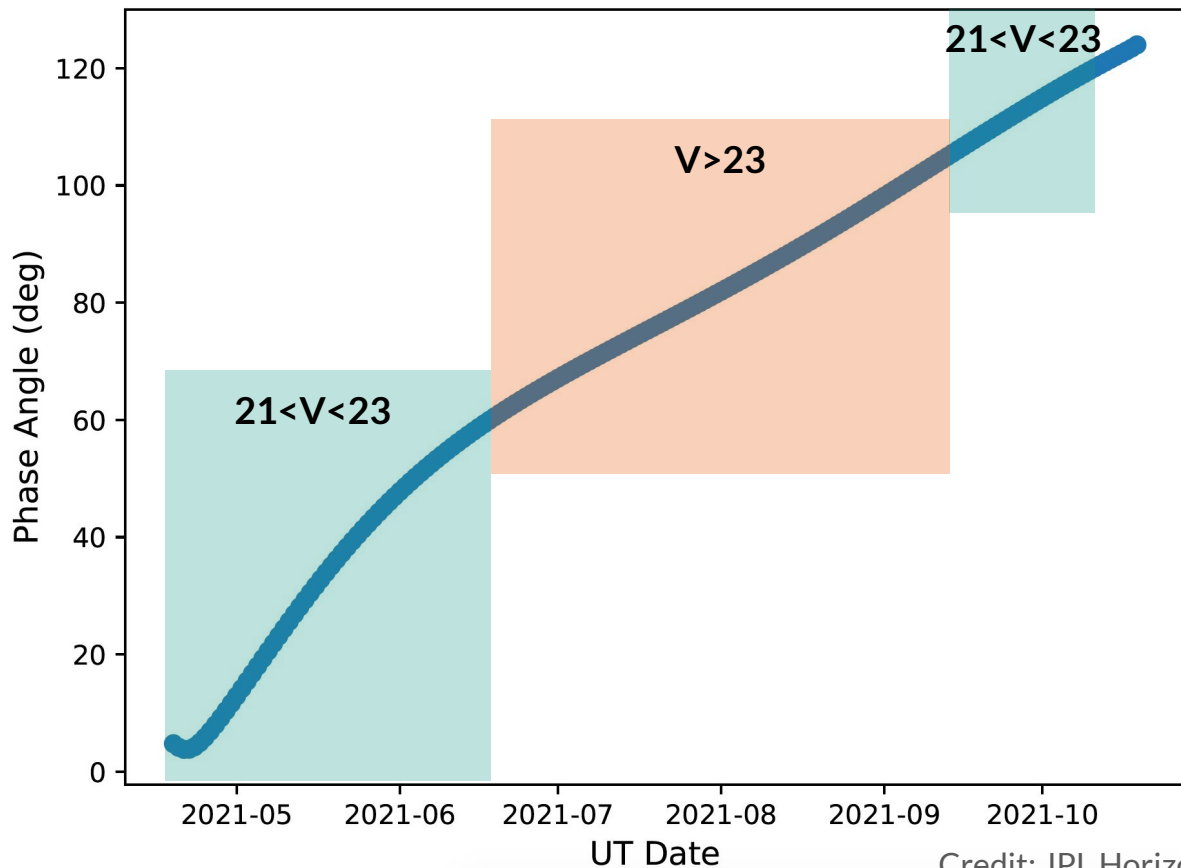
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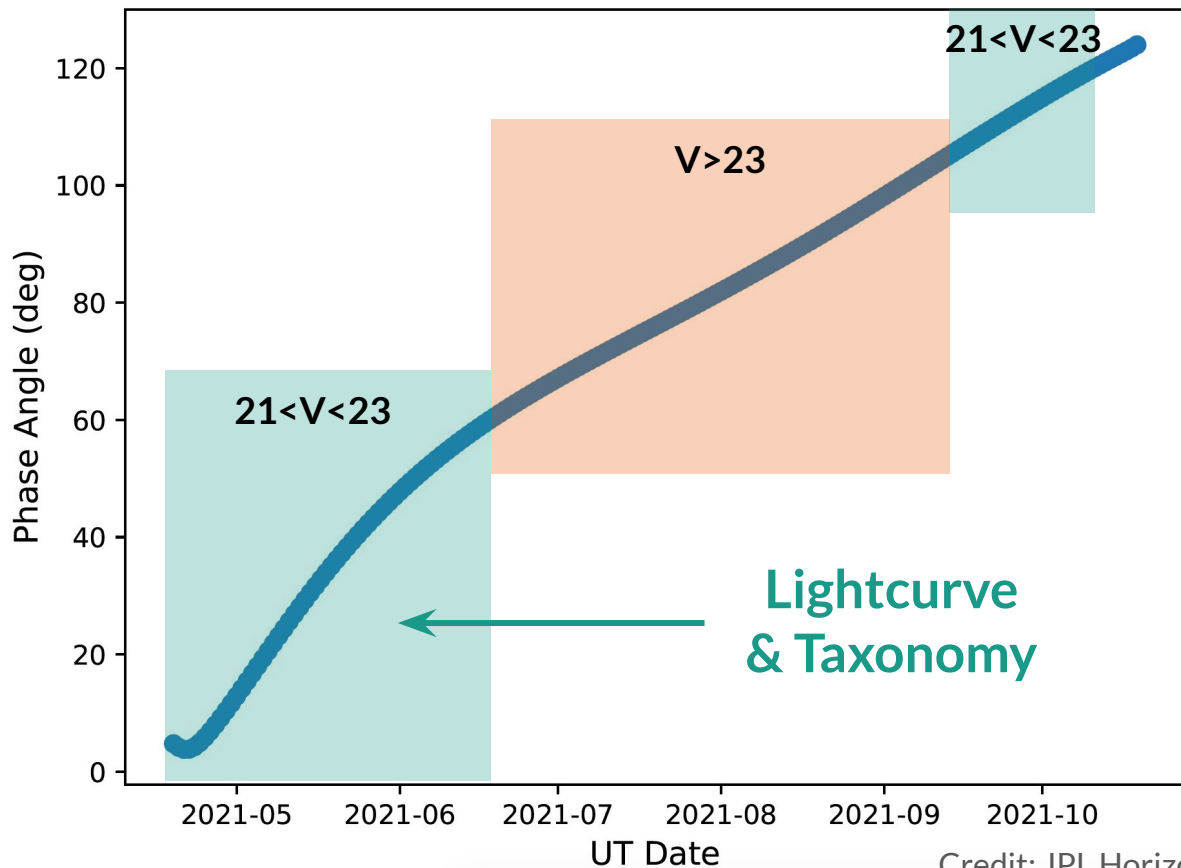
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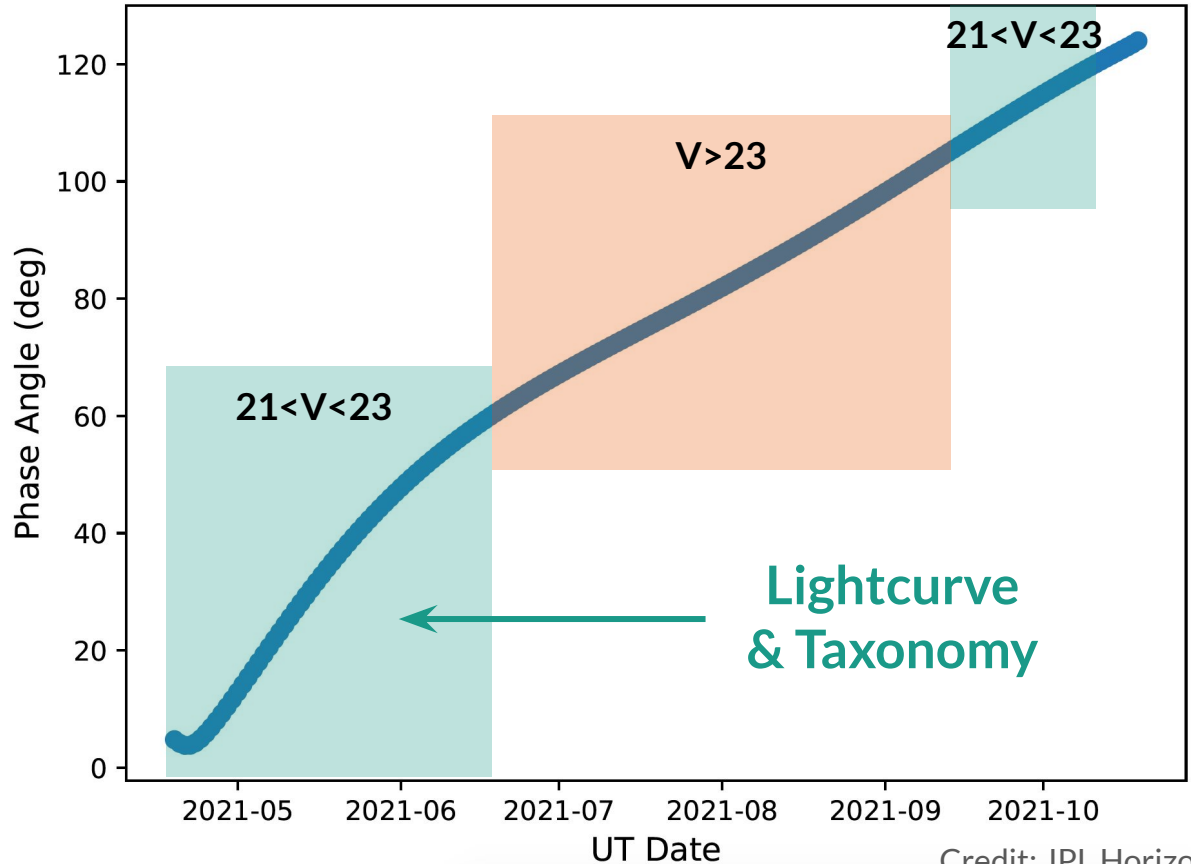
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2021 PDC Phase Curve



Thermal Flux ~ 0.1 mJy at $10\text{ }\mu\text{m}$

2021 PDC detectable with JWST
End of May - Beginning of July

2021 PDC Phase Curve



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Implemented Hapke Radiative
Transfer modeling to constrain
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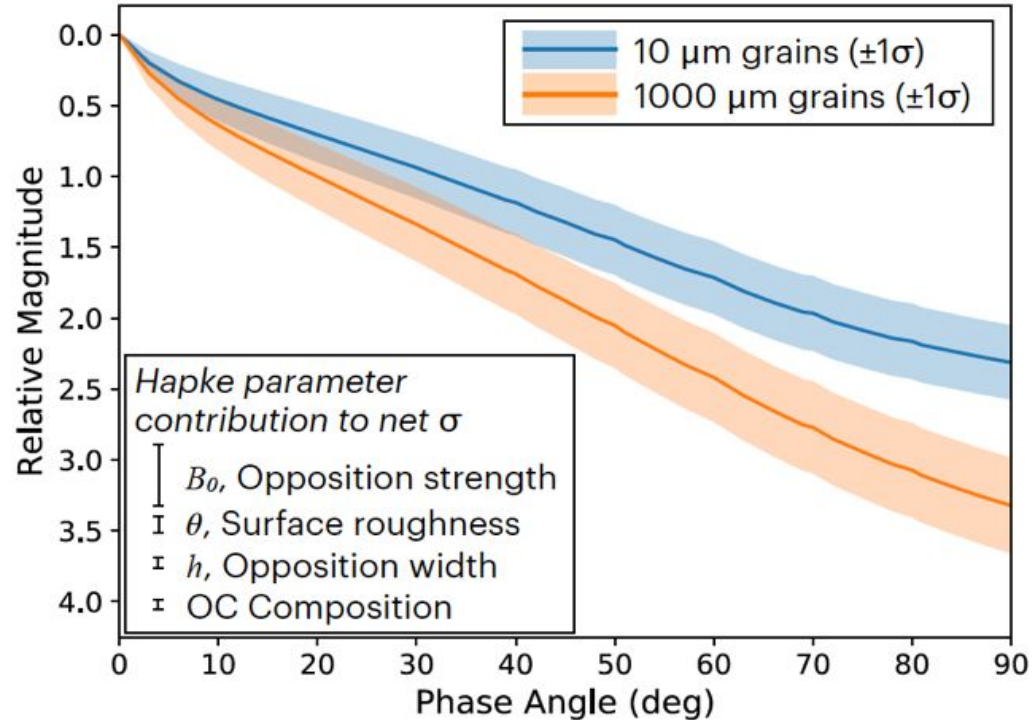
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We assume 2021 PDC is an S-type asteroid



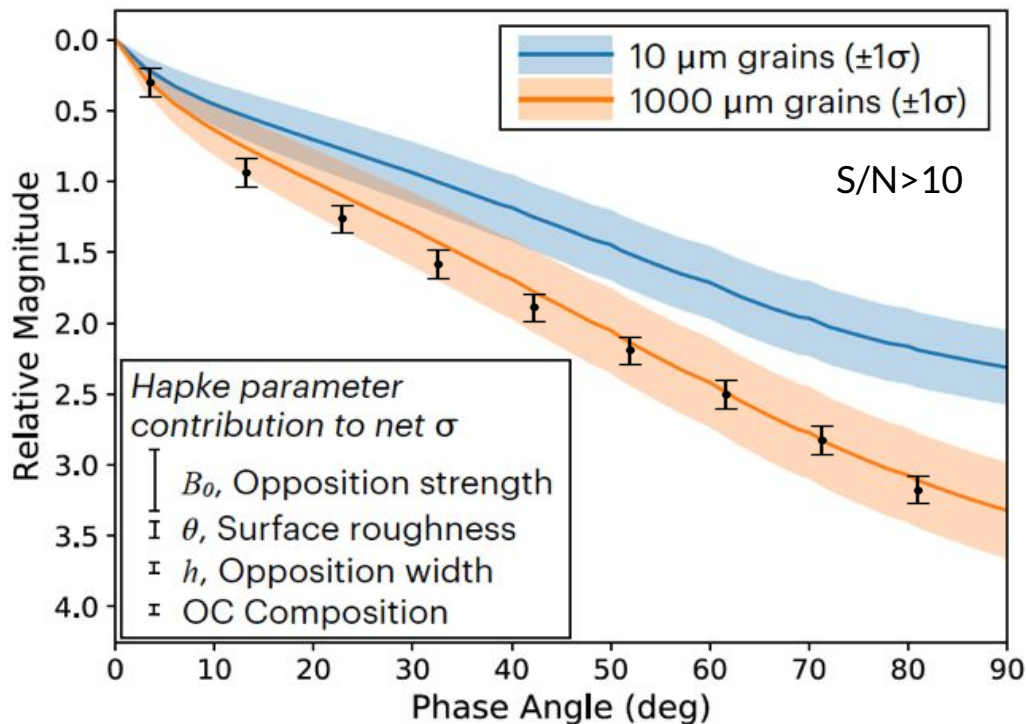
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2021 PDC Characterization

- Size — Avg. Taxonomic Albedo: S-types → 80 m
- Albedo — Avg. Taxonomic Albedo: S-types → 0.26 (Thomas+2011)
- Shape — Light Curve a:b ratio → Round or Elongated
- Composition — Spectrophotometric Classification: S-type
- Surface Properties — Coarse Surface Regolith → Monolithic Structure
- Density — Avg. Taxonomic Density: S-types → 2.71 g/cm^3 (Krasinski+2002)

Together these physical properties can be used to inform impact models and threat assessments as early as 3-4 months prior to the impact event