Deep space observations of oriented ice crystals

Science Question: Can clouds containing horizontal ice crystals be identified from deep space?

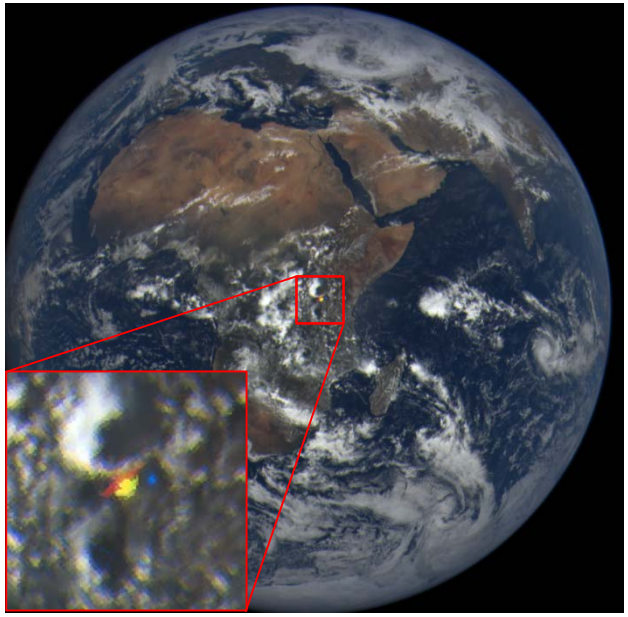

Image taken by DSCOVR's EPIC camera on March 17, 2016 at 9:46 UTC

Finding: The image shows colorful glints from horizontally oriented ice crystals that float in clouds over Africa. Such glints appear colorful in EPIC images because the red, green, and blue images are taken a few minutes apart, and during this time the Earth's rotation changes the location where EPIC can observe the specular reflection of sunlight.

Impact: Such observations can help determine how common these horizontal crystals are, and whether they significantly impact the amount of sunlight that passes through clouds and warms the surface, thus affecting the radiation budget of Earth.

Why It Matters: This information can help improve climate models by allowing them to represent ice clouds more accurately. Such data can also help improve the interpretation of other satellites' cloud observations by providing insights into the way horizontal ice crystals can shape cloud reflection. Finally, detecting glints may also help in using future satellites to characterize exoplanets orbiting distant stars.

Marshak, A., T. Várnai, and A. Kostinski, 2017: Terrestrial glint seen from deep space: oriented ice crystals detected from the Lagrangian point. *Geophysical Research Letters*, 44, doi: 10.1002/2017GL073248.