National Aeronautics and Space Administration
Jet Propulsion Laboratory
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# Evaluation of The Cloud Phase Transition in Climate Models

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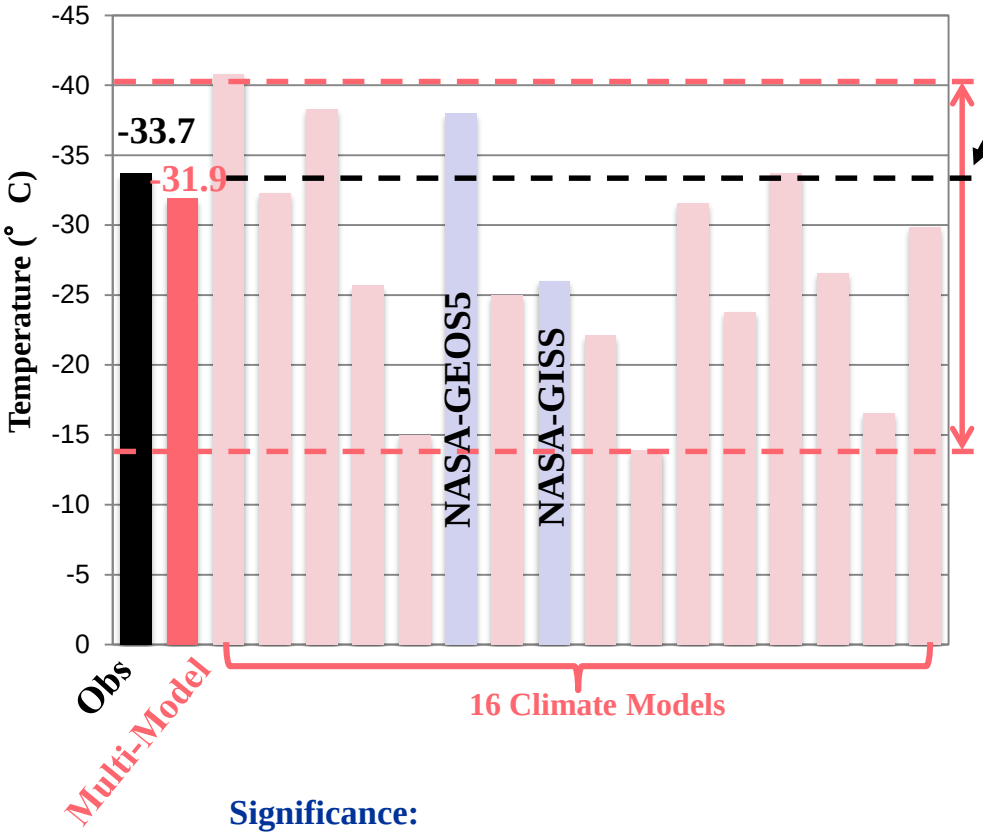
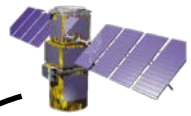
## Transition Temperature from Mixed-Phase to Ice Clouds



CALIPSO

Inter-Model spread ~27° C

**Problem:**

- **Liquid** and **ice** clouds have **different radiative forcing** on the climate system.
- Their accurate representation in GCMs is **key** to **reducing** cloud-climate feedback **uncertainties**.

**Finding:**

- **Differences** in modeled cloud phase are **very large** (~27° C spread).
- The **transition** from mixed-phase to ice clouds occurs at **too warm temperature** in most models (i.e. not enough supercooled liquid clouds in the high troposphere).
- Models with **complex microphysics** scheme typically **better** represent the **cloud phase**.

**Significance:**

- **First study** to analyze the **cloud phase transition** of **multiple climate models** against satellite observations (including NASA GEOS5 and GISS models).
- Useful and original **tools** for modelers to **develop, test and improve** their **cloud scheme** at global scale.

**Cesana G.,** D. E. Waliser, X. Jiang, and J.-L. F. Li, 2015: « Multimodel evaluation of cloud phase transition using satellite and reanalysis data », *J. Geophys. Res. Atmos.* , doi:10.1002/2014JD022932



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