



A season of methane distributions on Titan

Eliot Young (1), Jason Barnes (2), Carrie Anderson (3), Robert Samuelson (3), and Erika Barth (1)

(1) Southwest Research Institute, Space Studies, Boulder, United States (efy@boulder.swri.edu), (2) University of Idaho, (3) NASA/GSFC

The three dimensional distribution of methane in Titan's atmosphere is diagnostic of several interesting quantities. Profiles in altitude and latitude can constrain circulation models. Methane number densities - in conjunction with temperature profiles - suggest where clouds should or should not form. And local variations in methane abundances can support or rule out local sources on Titan's surface.

We present preliminary 3-D methane retrievals from Keck, HST and Cassini VIMS observations, from 2000 to 2008, from the surface to altitudes of roughly 100 km. We compare the effects of using different methane absorption coefficients currently in the literature. We use a radiative transfer code to account for the spherical geometry of Titan's limb. A goal of this work is to investigate time variability of methane concentrations on timescales of months to a decade.