Geophysical Research Abstracts
Vol. 14, EGU2012-13409, 2012
EGU General Assembly 2012

FINESSE - the Fast INfrared Exoplanet Spectroscopy Survey Explorer

M. Swain
(Mark.R.Swain@jpl.nasa.gov)

FINESSE, the Fast Infrared Exoplanet Spectroscopy Survey Explorer, is the first mission dedicated to finding out what exoplanet atmospheres are made of, what conditions or processes are responsible for the composition, and how our own solar system fits into the larger family of planets. The last 15 years have witnessed extraordinary success in finding exoplanets. FINESSE is designed to take the next step - characterizing exoplanet atmospheres. Using proven methods and an instrument optimized for stability, FINESSE would be the first mission dedicated to the spectroscopic characterization of exoplanets as a class of objects. During a two-year mission, FINESSE would survey 200 transiting exoplanets ranging from the most extreme hot-Jovians to cool Neptunes and Super-Earths. FINESSE's science instrument, a spectrograph covering 0.7-5.0 microns, provides excellent sensitivity to important molecular bands of water, methane, carbon monoxide, carbon dioxide, and other molecules. Interpretation of FINESSE measurements will reveal the composition, temperature structure, and chemistry of exoplanet atmospheres and provides a basis for comparing exoplanets in a uniform way. Engineered for exquisite 100 ppm stability, FINESSE will determine the differences between the dayside and nightside of exoplanet atmospheres by precision measurements of the system phase curve. Implemented as a rapid, low-cost, high-heritage mission, FINESSE is scientifically well matched to the rapidly expanding field of exoplanets.