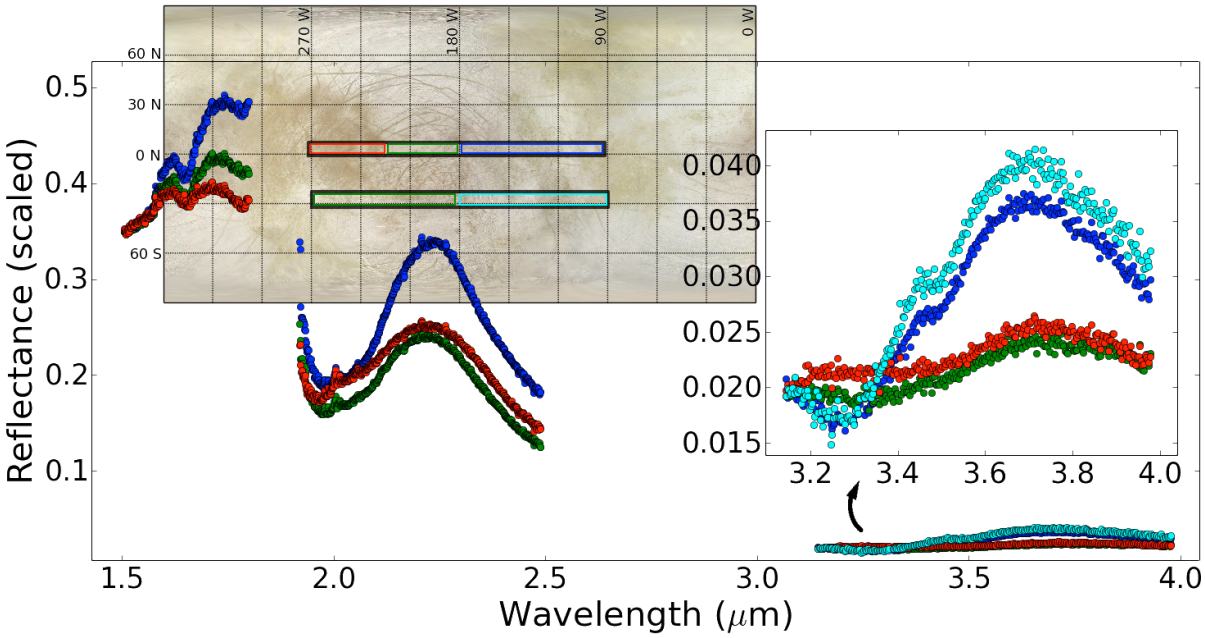
Exploring Europa's Surface at 3-4 µm. Patrick D. Fischer[1], Michael E. Brown[1], Kevin P. Hand[2], [1]California Institute of Technology, [2]Jet Propulsion Laboratory



We present 3-4 µm, moderate resolution, spatially-resolved reflectance spectra of Europa's surface, obtained with Keck II NIRSPEC and adaptive optics. We spatially and spectrally resolve geologic units [1] and global compositional units [2], and cover regions unreached spectrally and geographically by Galileo NIMS [3,4]. The figure shows preliminary results. Black rectangles show the location of the NIRSPEC slit on two observations. Extracted spectra indicate potentially distinct compositions (spectra are normalized to 0.35 at 1.5 µm or to 0.02 at 3.1 µm) Colored rectangles relate geographic regions to spectra, and indicate locations of distinct compositions.

With these data we will explore the regional distribution of H_2O_2 (~3.5 µm feature), a chemical of astrobiological interest for Europa [5,6]. Mapping the distribution of H_2O_2 will reveal its dependence on surface temperature [7] and abundance of water ice [8], and yield a more accurate measure of oxidant delivery rates to the subsurface ocean. Resolving individual geologic and compositional units will distinguish exogenous from endogenous spectra. In particular, this will build upon the set of high resolution spectra of chaos units, and help to reveal the nature of endogenous salts thought to be associated with these regions [2].

References: [1] Doggett, T. et al. (2009) in *Europa*, University of Arizona Press, 137. [2] Fischer, P.D. et al. (2015) *in prep*. [3] McCord, T.B. et al. (1999) *JGR, 104,* 3311. [4] Carlson, R. W. et al. (2005) *Icarus, 177,* 461. [5] Chyba, C. F. & Hand, K. P. (2001) *Science, 292,* 5524. [6] Hand, K. P. et al. (2009) in *Europa,* University of Arizona Press, 589. [7] Hand, K. P. & Carlson, R. W. (2011) *Icarus, 215,* 226. [8] Hand, K. P. & Brown, M. E. (2013) *ApJ Letters, 766,* L21.