

Visualization of Surficial and Internal Structure and Chemistry
Utilizing CT and Neutron Imaging

Rohit Bhartia
Alexandre Tsapin, Ph.D
Jet Propulsion Laboratories, Pasadena, CA

Andrew R. Thompson
Robert T. Wang Ph.D,
Charles Suey
CMS, Pasadena, CA

Non-destructive techniques, such as X-ray and neutron tomography, have been used to provide an insight to structure and chemistry of minerals and biological samples. With these methods, details of surface topography and internal structures can be resolved based on atomic numbers of elements constituting structures of interest. Also, a potential contamination of the interior of the sample can be estimated by visualizing fractures and/or pores. The newest scanning technology has a resolution of up to 4 micrometers/pixel. In order to fully understand the resulting data 3-dimensional surficial and volumetric visualization techniques are being utilized. To do this we are using software created by CMS. Three-dimensional rendered images can be rotated, “sliced”, and enhanced to display surficial and hidden internal features for each technique. We present here data showing the potential possibility to determine the elemental composition of internal structures by superimposing images obtained by X-ray and neutron tomography. In addition 3D volumetric images will allow to locate a region of interest as a future target for other more sensitive but usually destructive methods.