

Elemental abundances from x-ray fluorescence spectroscopy

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Abstract. Historically, surface composition of Moon through remote sensing was primarily studied using NIR spectroscopy and gamma ray spectroscopy which are indirect in nature. In comparison, X-ray fluorescence (XRF) spectroscopy is a more direct approach and quantitative abundances can be derived using fundamental parameter equations. Solar X-rays during flares trigger characteristic XRF lines from the lunar surface. Modelling the observed line intensities, it is possible to derive the elemental abundances of the surface. Chandrayaan-2 Large Area Soft x-ray Spectrometer (CLASS) is an XRF experiment on-board Chandrayaan-2 to map the surface composition of the Moon. From a 100 km polar orbit, the instantaneous ground pixel is 12.5km x 12.5 km, which is the best spatial resolution till now. Increased geometric area has led to increased sensitivity thereby giving XRF signals in the case of sub B class flares. This presentation will cover the methodology adopted for converting XRF spectrum into elemental abundances. Initial results from CLASS including global flux maps of Mg, Al and Si and abundances derived in Mare Imbrium region will be presented.