Heavy metals and sediment fluxes in Coatzacoalcos River estuary: A history of land use changes

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This work describes the historical changes in sedimentation rates and trace metals supply from Coatzacoalcos River into the continental shelf of the Gulf of Mexico. The Coatzacoalcos River estuary is considered the most polluted coastal area of Mexico, mostly due to the oil industry established in its watershed. Magnetic susceptibility data and ^{210}Pb-derived sedimentation rates suggested that a substantial sediment remobilization occurred during the last 30 years, attributed to watershed erosion due to land use changes, promoted by the petrochemical activities in the area. Despite the pollution potential, low metal enrichment was observed in this study. This work was supported by the IAEA-Regional Project RLA7012.

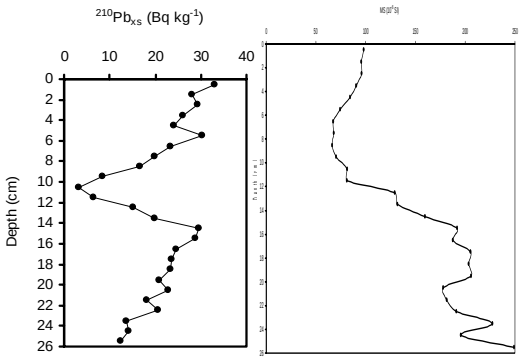

Figure 1: ^{210}Pb and magnetic susceptibility depth profiles from Coatzacoalcos River Estuary.

In situ surface Raman analysis of organics: Applications in planetary exploration

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Introduction

ExoMars is the first ESA flagship mission of the Aurora program that will send a rover to the surface of Mars in 2016. The main aim of this mission is the search for past and present life on Mars. The Raman Laser Spectrometer (RLS) is part of the rover's payload (Pasteur). This instrument will perform experiments outside and inside the rover with two dedicated optical Raman heads. Outside the rover analysing surface samples and inside the rover analysing cores obytained by a drill.

Results and Discussion

In the present work results obtained in relation with the objectives of identify organic compounds and search for life and identify mineral products and indicators of biological activity are presented and discussed. These results were obtained using a portable prototype for field surface analysis at AMASE 2007 and 2008 campaigns in the Artic [1]. In Figure 1 the Raman probe head working on surface samples at Palander Bay and the spectra obtained in-situ are depicted. The mineralogy of the samples was established in detail. Also beta-carotene was detected in several cases allowing to show the potential of Raman spectroscopy for detection of indicators of biological activity.

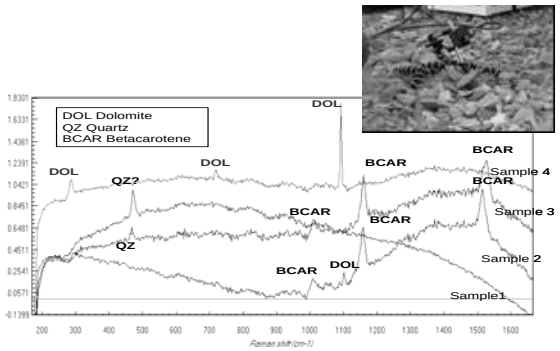

Figure 1: The Raman probe working at the surface in Palander Bay and some of the Raman spectra obtained.

[1] AMASE- Artic Mars Analog Svalbard Expedition, 2007 and 2008.