OBSIDIAN CHARACTERIZATION USING MOSSBAUER SPECTROSCOPY AND ELECTRON SPIN RESONANCE: APPLICATIONS TO ARCHAEOLOGICAL ARTEFACTS PROVENANCE IDENTIFICATION.

R. B. Scorzelli(1), A. M. Rossi(1), S. Petrick (1), G. Poupeau (2), L. Berlot-Gurlet (2) and G. Bigazzi (3)(1) Centro Brasileiro de Pesquisas Físicas, Rio de Janeiro, Brazil(2) 2UPRES-A 5025 of CNRS, Université Joseph Fourier, Grenoble, France(3) Istituto di Geocronologia e Geochimica Isotópica, Pisa/Italy.

Obsidian is one of the most important material for archeological artefacts proveniance studies. The techniques used for this purpose are generally based on the analysis of the sample chemical composition and sample age formation. In this work, we characterized mediterranean obsidians with Mossbauer and Electron Spin Resonance spectroscopy. From these techniques it is possible to obtain relevant information about the distribution of iron ferromagnetic precipitates as well as from the local environment of isolated Fe2+ and Fe3+ ions in the obsidian structure. In this work, it is shown that structural and magnetic proprieties of iron which are related to the obsidian thermal history can be used to distinguish obsidians from different geological sources. A methodology to classify obsidians archeological artefacts from different provenance is proposed and evaluated.