



## **Development and application of high resolution petrography on resin-impregnated Holocene peat columns to detect and analyse tephras, cryptotephras, and weathered materials**

François De Vleeschouwer (1), Brigitte van Vliët-Lanoé (2), Nathalie Fagel (1), Thomas Richter (3), Xavier Boës (1,4)

1. Unité de Recherche Argiles et Paléoclimats, Université de Liège, Allée du 6 Août, B18, Sart Tilman, B-4000 Liège, Belgium, (2) UMR 8110 CNRS Processus et Bilans des Domaines Sédimentaires, Université Sciences et des Technologies de Lille, SN5, B-59655 Villeneuve d'Ascq cédex, France, (3) Department of Marine Chemistry and Geology, Royal Netherlands Institute for Sea Research (NIOZ), P.O. Box 59, 1790 AB, Den Burg (Texel Island), The Netherlands, (4) Now at Royal Observatory, Seismology, Ringlaan 3, B-1180 Brussels (fdevleeschouwer@student.ulg.ac.be / Phone : +32 4 366 22 10 / Fax : +32 4 366 22 02)

We describe the potential for high-resolution detection, observation and chemical analysis of tephras and cryptotephras in freeze-dried and resin-impregnated peat sections. Special attention is drawn to tephra grain alteration products, sensitive to standard lab treatment, but preserved using an impregnation technique developed here. Resulting blocks and thin sections provide a continuous archive of tephras that can be investigated through a wide range of non destructive techniques encompassing polarizing and fluorescence microscopy, scanning electron microscopy with/without elemental analysis, and XRF-based core scanning. We present several examples which illustrate the potential applications and limitations of impregnated peat which contain tephra from Iceland, Germany, and Belgium.

The impregnation of tephra-containing peat sections and their subsequent study in thin section using various techniques allows a broad range of observations useful not only for the field of tephrostratigraphy but also for studies of tephra alteration mechanisms and by-products, for discriminating between reworked or *in situ* tephra and

for detecting of cryptotephra. It has potential for a wide range of chemical investigations leading to a better understanding of the chemical signature of tephra and their alteration products.