Luminescence Dating of Old Crow and Dawson Tephras using Fading-corrected Feldspar IRSL

Stéphanie Ouimet*, Michel Lamothe

Infrared stimulated luminescence technique (IRSL) has been used for dating the Late Pleistocene Dawson tephra and the Middle to Late Pleistocene Old Crow tephra. Those tephras were respectively sampled from the Quartz Creek site in Yukon and from the Yukon-Charley River site in eastern Alaska. Whilst the age of Old Crow tephra is already known by glass fission-track (131 ± 11 ka) and that of Dawson is cross-dated between 25,420±70 and 25,290±80 ^{14}C years BP using radiocarbon, luminescence dating is now tested in order to both a) validate the fading corrections applied to feldspars luminescence dating (IRSL) and b) develop a new dating tool to decipher the Late Quaternary history of volcanoes. The extraction of fine sand-sized feldspar from both tephra is a difficult task and luminescence yielded using both thermal and optical stimulation is rather small and variable. However, in the case of the older Old Crow tephra, most aliquots emit a 3 to 4 signal to background ratio, sufficient for the estimation of the equivalent dose, the fading g value, and hence of the absolute age. Dawson tephra is apparently poorer in mineral content and therefore other laboratory techniques are being tested to further separate the glass shards from the feldspars.