J158-014 **Room: 201B** **Time: May 26 12:03-12:15**

Earthquakes produce carbon dioxide in crustal faults

Vincent Famin[1]; # Satoru Nakashima[2]; Anne-Marie Boullier[3]; Koichiro Fujimoto[4]; Tetsuro Hirono[5]

[1] Geosci., Univ. de la Reunion; [2] Dept. Earth & Space Sci., Osaka Univ.; [3] Université Joseph Fourier; [4] TGU; [5] Osaka Univ.

Fourier transform infrared (FTIR) micro-analysis of pseudotachylytes (i.e. friction-induced melts produced by seismic slip) from the Nojima fault (Japan) reveals that earthquakes almost instantaneously expel 99 weight percent of the wall rock CO2 content. Carbon is exsolved because it is supersaturated in the friction melts. By extrapolation to a crustal-scale fault rupture, large events such as the M7.2 Kobe earthquake (1995) may yield a total production of 1.8 to 3.4 x 10^3 tons CO2 within a few seconds. This extraordinary release of CO2 can cause a flash fluid pressure increase in the fault plane, and therefore enhance earthquake slip or trigger aftershocks; it may also explain the anomalous discharge of carbon monitored in nearby fault springs after large earthquakes. Because carbon saturation in silicate melts is pressure-dependent, FTIR can be used as a new tool to constrain the maximum depth of pseudotachylyte formation in exhumed faults.