**COMBINED NON DESTRUCTIVE ANALYSES APPLIED TO GRAINS FROM THE STARDUST TRACK C2103,10.**

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**Introduction.** Ten grains from the Stardust track C2103,10 are analysed by different non destructive techniques that give indications both on the mineralogical and organic compositions of the particles (IR and Raman spectroscopy combined to FE-SEM and EDX). These grains have been extracted from different positions along the track, between the entrance and the terminal particle. Aerogel fragments originating from the same keystone are also analysed with the same techniques. The aim of this study is to obtain morphological, chemical, mineralogical, and organic characterizations of 81P/Wild 2 dust samples by characterizing the incident grain, its slowing down evolution, fragmentation, and its interaction with the aerogel.

**Experimental techniques.** In order to avoid handling and micromanipulation of the samples, we designed special sample holders, described elsewhere [1], that allow clean and safe particle transportation and multiple sample analyses. We perform a combined set of micro-IR (transmission), micro-Raman, FESEM, and EDX analyses. The IR analysis is performed using a synchrotron beamline at SOLEIL (France), which allows to map the samples with a spatial resolution up to ~3 µm.

**First results**. A first IR analysis of the cometary and the nearby aerogel samples shows relevant contribution of the aerogel in the spectra of the extraterrestrial grains, as already largely observed (e.g. [2]). During the slowing down, melted or compressed aerogel is strongly mixed with the residues of the incident particles; the effect is more pronounced with respect to other Stardust tracks previously studied by PET analyses [3]. Two grains, extracted from about the entrance and termination of the track, show clear IR organic signatures, due to aromatic and aliphatic compounds respectively, that are indigenous to the sample. Silicates are detected in the terminal grain, mainly in the form of amorphous low-Fe olivine (forsterite), with a minor contribution of crystalline olivine and pyroxene. The IR analysis is followed by Raman spectroscopy, sensitive to the degree of disorder of the carbonaceous structure, both in extraterrestrial carbons and laboratory analogues (e.g. [4,5]), and by microscopic investigation (FESEM and EDX) delivering a complementary information on the composition and the structure of the grains. Preliminary results will be discussed.

**References:** [1] Rotundi, A., et al. 2007, In *Dust in planetary systems*, ESA Publication SP-643. pp. 149–153. [2] Muñoz Caro, G. M., et al. 2008. A&A 485, 743–751. [3] Rotundi, A., et al. 2008. Meteorit. Planet. Sci. 43 (1/2), 367–397. [4] Baratta, G.A., et al. 2004. J. Raman Spectrosc. 35, 487–496. [5] Brunetto, R., et al., 2009. Icarus 200, 323–337.