A STATISTICAL OVERVIEW OF CONCORDIA ANTARCTIC MICROMETEORITES E. Dobrică[1], C. Engrand[1], J. Duprat[1] and M. Gounelle[2]. [1]CSNSM, UMR8609 CNRS-Univ. Paris Sud, 91405 Orsay Campus, France. E-mail: elena.dobrica@csnsm.in2p3.fr. [2]LMCM, UMR 7202 CNRS&MNHN, CP52, 57 rue Cuvier, 75005 Paris, France.

Introduction: The CONCORDIA Antarctic micrometeorite (AMM) collection was recovered in 2000, 2002 & 2006 from snow layers at Dome C, near the CONCORDIA station [1]. Compared to previous AMM collections in blue ice fields, it contains two new populations of objects, the fine-grained-fluffy (FgF) micrometeorites that resemble chondritic porous anhydrous IDPs [2], and ultracarbonaceous micrometeorites (UCAMMs) exhibiting large D-enrichments [3]. In this work we give a statistical view of all types of AMMs recovered in a selection of filters from the 2006 campaign.

Samples and methods: Thirteen filters conditioned under dry nitrogen were returned from Antarctica in 2006, containing the filtration residues of a total of ~25 m^3 of ultraclean snow. Up to now, all particles have been extracted from six of these filters (corresponding to the filtering of ~14 m^3 of snow). All grains (except cosmic spherules) were split into several fragments. The smallest fragment of each grain was mounted on a conductive tape. The extraterrestrial particles were identified by scanning electron microscopy (SEM) equipped with energy dispersive X-ray spectroscopy (EDS) at 15kV.

Results and discussion: Depending on the filter, the proportion of extraterrestrial (ET) material (including cosmic spherules) varies from 57% to 89% of the total number of grains analyzed. From these filters, 1019 ET particles have been identified. Slightly less than half of the ET particles (444) are completely melted (i.e. cosmic spherules). Unmelted to partially melted particles have been classified according to [4]. The abundance of fine-grained (Fg) AMMs vary between 9% and 35% (av. 27%), the crystalline micrometeorites (Xtal) between 1% and 9% (av. 6%), the scoriaceous particles (Sc) between 8% and 36% (av. 22%), and the cosmic spherules (CS) between 28% and 81% (av. 44%). Concerning sub-families of Fg particles, the abundance of fine-grained fluffy (FgF) varies between 5% and 23% (av. 11%) of the total ET particles and the fine-grained compact (FgC), between 4% and 22% (av. 16%). From our sampling, UCAMMs represent 2% on average of all ET grains. Assuming a mean density of 2.5 for the AMMs, of 3 for the CSs, and using an ellipsoid approximation, the total mass of ET material extracted from these six melts is estimated to ~880 µg (~340 µg for AMMs, and 540 µg for CSs). The unmelted particles range in size from to 13 µm to 300 µm for their major axis, and from 11 µm to 204 µm for their minor axis. UCAMMs, which are particles of probable cometary origin [3], vary in size from 20 µm x 23 µm to 110 µm x 275 µm. UCAMMs represent large unmelted samples with a probable cometary origin that survived atmospheric entry heating. Due to large eccentricity of their orbit, large cometary particles (>70 µm) were not expected to survive the atmospheric entry [5]. However, the orbit of cometary debris in the size range of 100-200 µm can be circularized and thus enter the Earth atmosphere at typical asteroidal speeds (~ 14.5 km s^{-1}) that could explain their recovery in terrestrial cosmic dust collections [e.g. 6,7].

References: [1] Duprat J., et al. 2007. *Adv. Space Res.* **39**, 605-611. [2] Bradley J. P. 2005. *Treatise on Geochemistry,* Vol. 1, pp. 689. [3] Duprat J. et al. 2010. *Science* **328**, 742-745. [4] Genge et al., 2008. MAPS 43, 497-515. [5] Love S. G. and Brownlee D. E. 1991. *Icarus* **8**9, 26-43. [6] Liou J.C. & Zook H. A. 1996. *Icarus* 123, 491-502. [7] Nesvorny et al. 2010. *Astrophys. J.,* **713**: 816-836.