



Gaia spectroscopic view of the asteroid main belt and beyond

Marco Delbo¹, Laurent Galluccio¹, Francesca De Angeli², Paolo Tanga¹, Alberto Cellino³, Thierry Pauwels⁴, and Francois Mignard¹

¹CNRS-Laboratoire Lagrange, Laboratoire Lagrange, Nice, France (delbo@oca.eu)

²Institute of Astronomy, University of Cambridge, Cambridge, UK.

³Instituto Nazionale di Astrofisica, Osservatorio di Torino, Torino, Italy.

⁴Koninklijke Sterrenwacht van België, Brussel, Belgium

Asteroids reflectance spectra in the visible light will be one of the novel products of the Gaia Data Release 3 (DR3). These spectra are produced from Gaia observations obtained by means of the blue and red photometers — the so-called BP and RP, respectively. We will review the strategy adopted to produce asteroid reflectance spectra from BP-RP data, focusing on the choice of spectrophotometric calibrations computed taking into account solar system object astrometry and suitable lists of solar-analog stars.

Our preliminary investigation shows that we will be able to obtain reflectance spectra for asteroids as small as some km in the main belt, by exploiting the fact that each object has been observed multiple times by Gaia. We will show the capability of Gaia to probe the detailed compositional gradient of the main belt down to small sizes and to study correlations between spectral classes and other asteroid physical parameters, such as albedo and size.

Concerning the brightest asteroids, we expect to have substantial signal at wavelengths shorter than 450 nm, allowing Gaia to examine this region of the spectrum that has been poorly investigated by ground-based asteroid spectroscopic surveys. This region is characterised by the presence of a reflectance downturn that is diagnostic for the composition of classes of primitive asteroids, for instance those including the parent bodies of carbonaceous chondrites. These asteroids may have played an important role for the delivery of prebiotic compounds to Earth during the early phases of solar system's history and, as such, are at the center of attention of the planetary science community.