Statistics of the Gaia Universe Model:
a tool to prepare the scientific exploitation of the Gaia mission.

Short visit grant - Scientific report

Purpose of the visit

The Observatoire of Besançon and the University of Barcelona have been cooperating for several years on the generation of simulated data for the preparation of the Gaia data reduction. In the process they have developed the expertise and the tools needed to produce realistic simulations of of the Gaia observations and catalogue.

Now this expertise can be put to work to provide meaningful predictions of the contents of the catalogue in the framework of GREAT.

Work carried out during the visit

During this week the student S. Blanco has worked with A. Robin to define a complete set of statistics of the characteristics of the objects to be found in the Gaia catalogue.

These statistics range from general object counts (e.g. total number of objects, percent of binaries and variables, etc.) as a function of magnitude, direction of observations, and for each instrument to analysis of specific distributions (e.g. orbital characteristics of the binaries, exoplanets, etc.), including not only stars but also galaxies and QSO.

Description of the main results obtained

The statistics have been applied to a large, full-scale simulation of the contents of the Gaia catalogue (one billion objects) and have been compiled and organized in a document. However, several errors have been identified in the simulation outputs which should be corrected before the final paper is submitted for publication.

Projected publications/articles resulting from the grant

The intent is to publish in "Astronomy & Astophysics" the complete set of statistics of the objects to be found in the Gaia catalogue that can be useful for the preparation of its scientific exploitation. Furthermore, the raw statistics will be made available to GREAT (ant the wider community) in suitable form.