The on-board data processing system of the EChO mission

Emanuele Pace[1], Christophe Cara[2], Jose Maria Castro[3], Anna Di Giorgio[4], Maria Farina[4], Mauro Focardi[1], Antonio García-Segura[3], Miguel Herranz de la Revilla[3], Luisa M. Lara[3], Jaime Jimenez Ortega[3], Maurizio Pancrazzi[1], Frederic Pinsard[2].

[1]Dipartimento di Fisica e Astronomia, Università di Firenze, Firenze, Italy [2]CEA, Saclay, Gif-sur-Yvette, France [3]Instituto de Astrofisica de Andalucia, IAA-CSIC, Granada, Spain [4]IAPS-INAF, Roma, Italy

The general architecture of the onboard data processing system is based on a modular concept with an Interface Control Unit (ICU) having a central role. It receives data from the Front End Electronics (FEE) of the 4 detector modules and after processing it sends them to the Spacecraft on board computer for storage and telemetry. ICU manages also telecommands and housekeepings. Hardware and software architectures are discussed of both the data processing system and of the FEE and ICU simulators that will be developed for the EGSE and AIV phases of the mission implementation. A crucial aspect, concerning the architecture of the FEE and ICU electrical and thermal links, is the FEE splitting in cold and warm parts in order to improve the thermal efficiency and simplify the subsystems AIV. The issue of data volume and data rate will be also discussed in some details.