THOR Particle Processing Unit (PPU)

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Turbulence Heating ObserveR (THOR) is the first mission ever flown in space dedicated to the study of plasma turbulence. On board THOR, the Particle Processing Unit (PPU), will be the single interface between the spacecraft and all the particle instruments: the Turbulent Electron Analyser, the Ion Mass Spectrum analyser, the Cold Solar Wind ion analyser and the Energetic Particle Experiment. The adoption of a common digital processing unit for all the particle instruments permits to optimize and save spacecraft resources. Moreover, the highly performing PPU components and architecture will permit to efficiently handle the high data rate from the numerous sensors of the particle instruments suite. It also allows to facilitate data processing on board and to coordinate the measurements among THOR instruments, an important prerogative of the THOR mission. The PPU design is based on a Dual Core LEON3FT processor and a number of FPGA based HW accelerators. Here, we will describe the PPU characteristics and functionalities.