

## **Using low power COTS DSP : assessment of Analog Devices Blackfin**

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For ten years, TSC21020F (fully compatible with ADSP21020) has been the workhorse of DSP based Data Processing Units throughout Europe. Its attractive features are its low SEU sensitivity, its floating point capability (60 Mflops peak) and its pin & code compatibility with a widespread commercial DSP. Many CNES sponsored instruments and payloads have used it as the core of their Data Processing Unit (e.g.: IASI, CIVA/Rosetta, OMEGA/Mars Express, ...). In the mean time, on-board payload data processing requirements have steadily increased, leading to TSC21020 based parallel processing architectures or to more powerful DSP COTS usage. That was the case on the DPU of the DEMETER payload where an ADSP-21060@40MHz was used to implement on-board analysis of the signals through neural networks. In 2006, CNES conducted a comparative evaluation, using benchmarks representative of space DSP applications, between 3 generations of Analog Device DSPs : TSC21020 (ATMEL), ADSP-21061 and Blackfin ADSP-BF532, the latter being a state of the art, low power, fixed point DSP running at 400 MHz. An evaluation board was developed for the Blackfin which enabled functional/performance evaluation as well as radiation testing (heavy ions). The benchmark software applications used were based on various flavours of FFTs and Wavelet Transforms. Comparative performance results will be presented together with Blackfin radiation testing output.