

The UniBoard

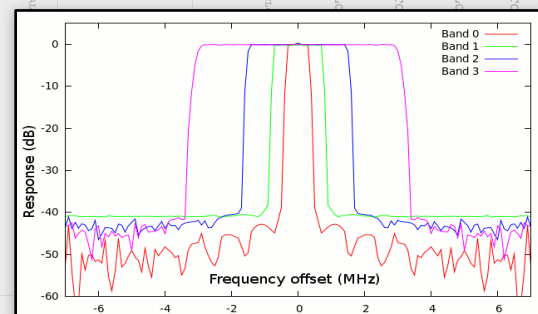
A multi-purpose, scalable, high-performance computing platform for radio-astronomical applications

Contract nr. 227290

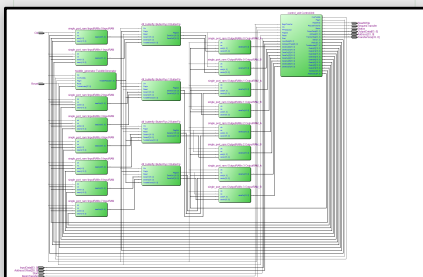
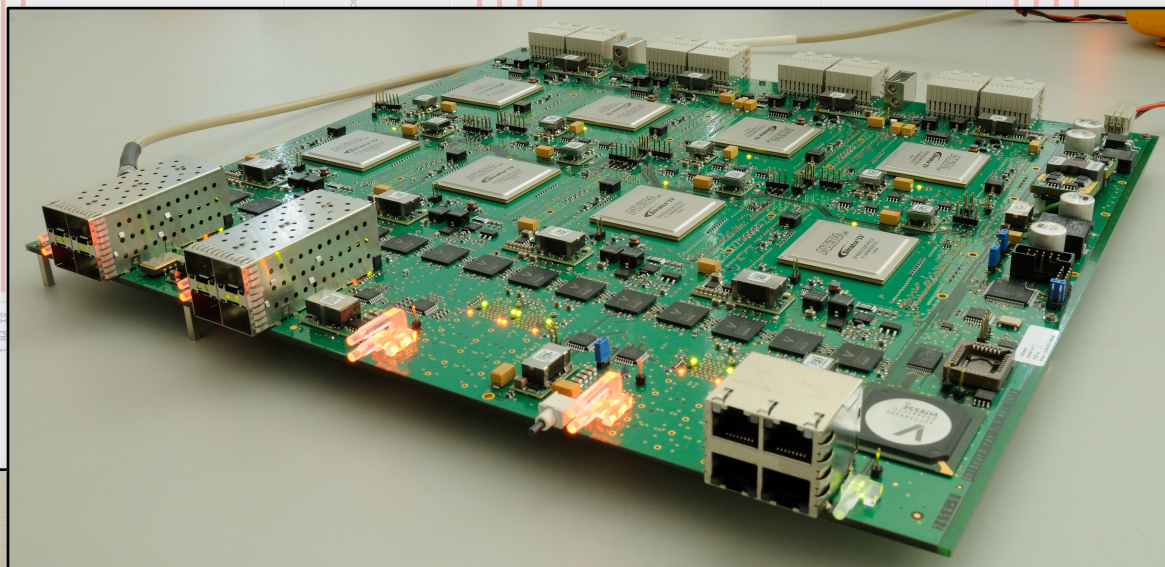
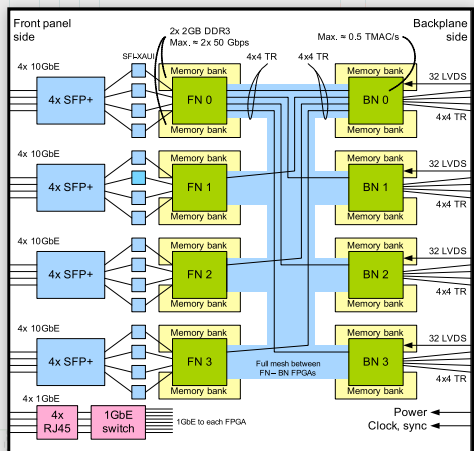


The Project:

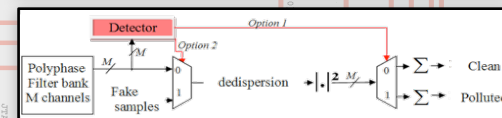
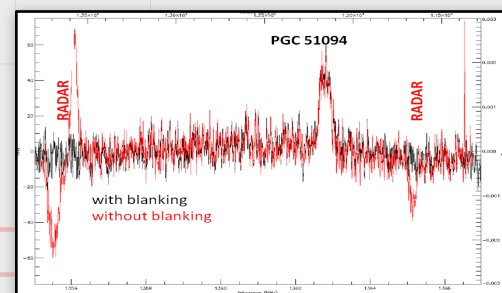
Generic computing platform for radio astronomy: as much computing power and I/O as will fit on a "reasonably" sized PCB
 8 × Altera Stratix IV 40nm FPGA, type EP4SGX230KF40C2, 1288 multipliers, 1517 pins
 Generic interfaces (1 and 10G Ethernet, DDR3 memory), 14 layers, one front node → all back nodes mesh
 Hardware design, several applications: VLBI correlator, Apertif correlator + beamformer, all-dipole LOFAR correlator, digital receiver, pulsar binning machine, RFI mitigation
 3.5-year project, started January 1 2009, funded by EC and participants (total of 1.4 Meuro)



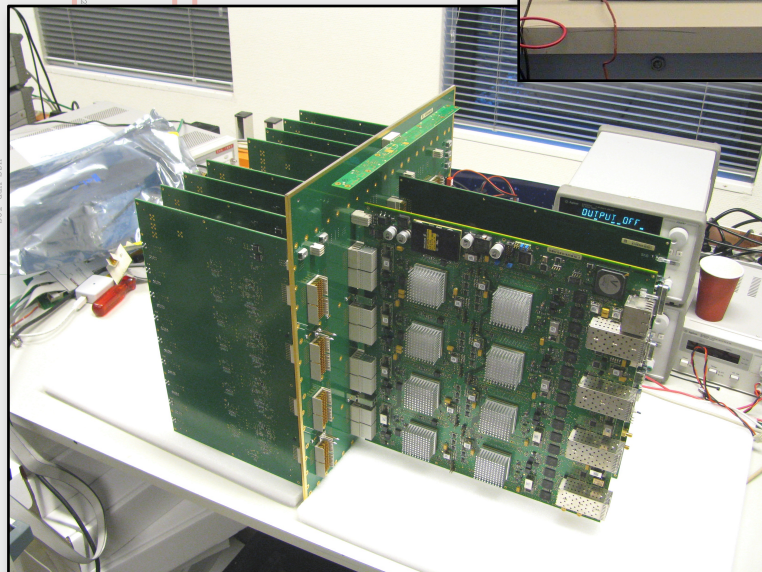
Response of digital BBC, 0.78 Mhz to 6.25 Mhz bands



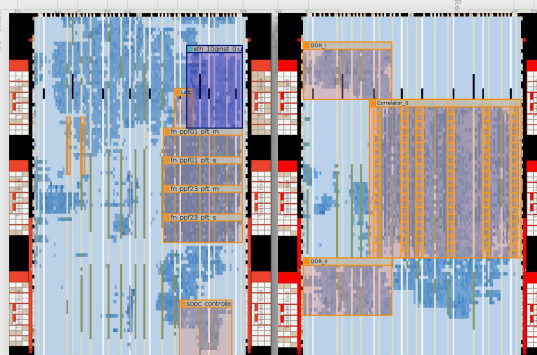
FFT module with 4 parallel butterfly units



RFI mitigation for pulsar binning machine



Apertif beamformer: midplane connecting ADUs, clockboard, UniBoards



Layout of VLBI correlator on front and back node