A 0.22 nV/√Hz, 4.5 mW/channel cryogenic amplifier for large arrays of SiPMs in liquid Argon

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This amplifier is designed to operate at LN or Lar for reading large area SiPM arrays, hundreds of nF. It is a hybrid solution with a SiGe HBT as input and a fully differential Bi-CMOS amplifier as second stage.

The result shown here was obtained with a preamplifier that dissipates 2 mW and has a series noise of 0.37 nV/√Hz. A new version with a noise of about 0.2 nV/√Hz and a power dissipation of 4.5 mW was developed (in background here).