

Highly integrated and scalable interface circuits for quantum processors

microwave multiplexing and experimentally cooling platform

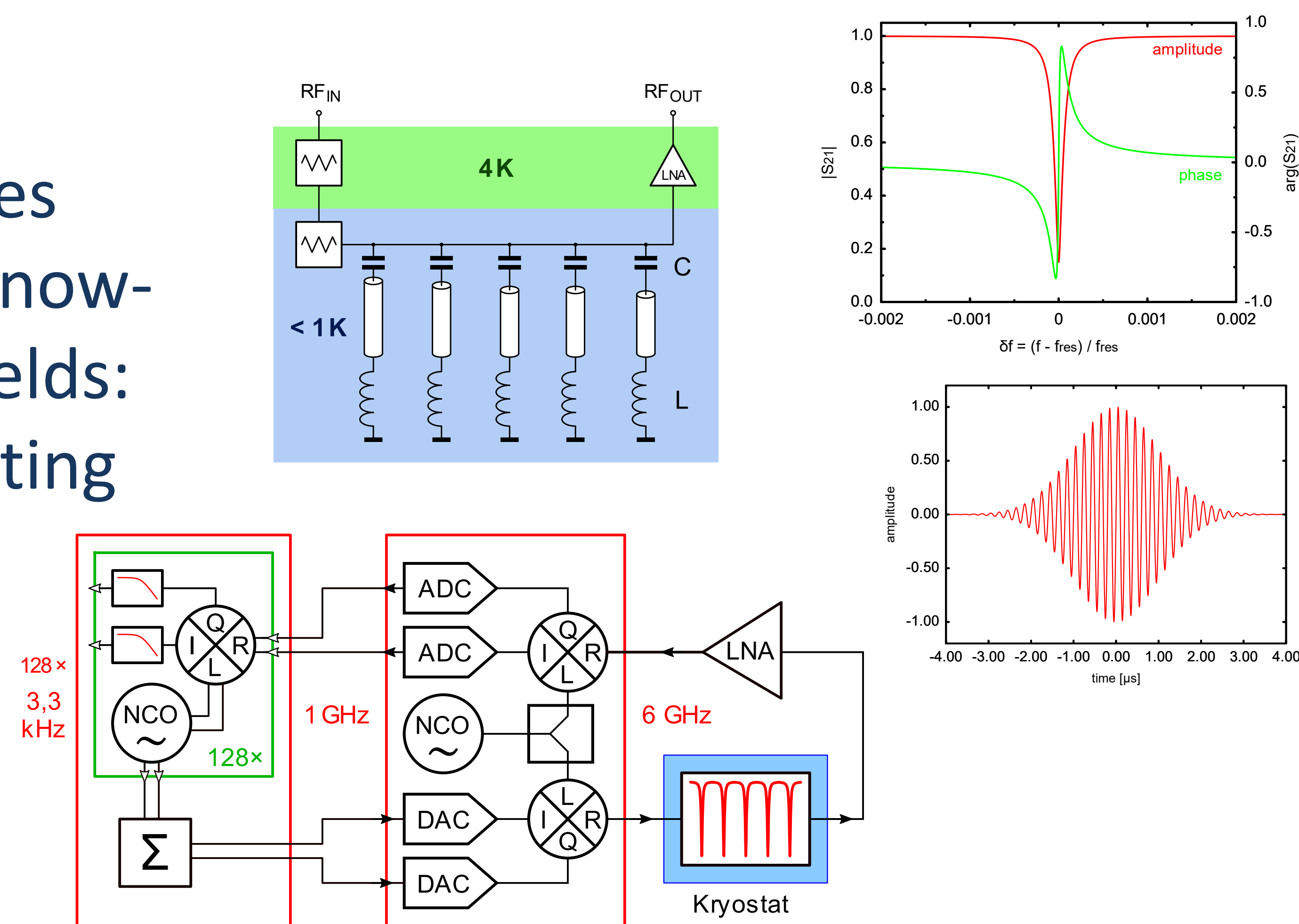
Partner's contribution

Supracon is a manufacturer of cryoelectronic devices and sensors since 2001. By introducing its unique know-how to the project, it will contribute in two main fields:

- Microwave multiplexed read-out of superconducting resonators,
- Setup of a 1K experimental platform for rapid prototyping.

Pulsed multiplexed microwave readout

- Multiplexed readout can reduce wiring complexity and thermal load,
- Superconducting resonators with different resonant frequencies in the 4–6 GHz range share a common transmission line,
- Multiple resonators are probed at once using a pulse-haped mix of probe signals,
- Probe signals are created and evaluated using heterodyne techniques and SDR digital processing.



1K platform for rapid prototyping

- Experimental platform with a base temperature of $< 1K$ using closed-cycle cooling techniques,
- Pulse tube cooler (250 mW @ 4.2 K) cascaded with continuous 4He sorption cooler (500 μW @ 1 K),
- turn-around time: 1 experiment per 2 days,
- 4 + 2 microwave coaxial lines, 32 DC lines,
- temperature monitoring and cooler control.

