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POLARBEAR-2 receiver system on the Simons Array telescopes for CMB polarization measurements

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POLARBEAR-2 (PB-2) is a new receiver system which will be mounted on the Simons Array telescope in early 2015
for Cosmic Microwave Background (CMB) polarization measurements at the Atacama desert in Chile.
The main science goal is to detect or set an upper limit of the inflationary gravitational wave B-mode.
Another important topic is to probe the large scale structure in the universe and constrain the sum of the neutrino
masses by measuring the weak gravitational lensing B-mode signal.
PB-2 receiver is a cryostat cooled by two pulse-tube coolers and a sorption refrigerator.
The receiver has 7588 dual-band antenna-coupled AlTi bilayer Transition Edge Sensor (TES) bolometers
for simultaneous measurements at 95 and 150 GHz with the expected array sensitivity (NET) = 5.7uKs^1/2.
The TES array is on the 350 mm diameter large focal plane cooled to 0.25 Kelvin
and is read out by frequency domain multiplexing with superconducting quantum interface device (SQUID) amplifiers housed on the 4 Kelvin stage.
Optical elements such as an alumina filter, metal mesh filters, alumina lenses and a half wave plate are carefully designed to meet the thermal and
optical requirements of PB-2.
We present an overview of PB-2 receiver system and the current status of its development.

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