

Topic	Very low noise preamplifier for bolometers: building and testing
Topic is suitable for	<ul style="list-style-type: none"> • practical works of bachelor students • graduation thesis of bachelor students • practical works of master students • graduation thesis of master students
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Annotation	We use very low temperature (0.3 K) bolometers to detect THz radiation by measuring the small changes of the electrical resistance (20 MOhm). The preamplifier is at room temperature at a distance of about 1.5 m from the bolometer. Because of the sensitivity ($10^{-15} \text{ W Hz}^{-1/2}$) the task is technically challenging and we require that the noise of the preamplifier should be better than $30 \text{ nV Hz}^{-1/2}$ in the frequency range from 0.1 to 100 Hz. The preamplifier should not pick up any radio frequency disturbances that would heat up the bolometer.
Expectation for candidate	Knowledge of general physics, analog electronics, interest in building something.