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Development of innovative electronics for a radiometer aimed at axion dark matter searches

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I am starting my second year thesis at Paris-Saclay university / CEA, within the ERC G-LEAD project, on the development of innovative electronics for a radiometer aimed at QCD axion dark matter searches.

My thesis focuses on developing a radiometer covering a frequency band from 10 GHz to 40 GHz, corresponding to a axion mass range of $50\mu\text{eV}$ to $150\mu\text{eV}$.

This detector is designed to measure an extremely faint signal, on the order of 10^{-26} W/kHz, buried in thermal and electronic noise. It is able of measuring the power frequency spectrum at the output of a horn antenna and a low-noise microwave amplifier chain, both operating in a cryogenic environment.

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