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Status and Future of the HAYSTAC Experiment

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The Haloscope At Yale Sensitive To Axion Cold dark matter (HAYSTAC) is both a data pathfinder and an innovation test bed for the 3-12 GHz (~ 12.5 -50 μeV) mass range. A collaboration of Yale, Colorado, Berkeley and Johns Hopkins, the experiment has pioneered the implementation of quantum-limited amplifiers and more recently a squeezed-state receiver which circumvents the standard quantum limit entirely. It has also driven the development of novel microwave cavities which are pushing up into the mass range corresponding to the post-inflation axion. Recent results will be discussed, as well as future plans for greater quantum acceleration and higher mass reach.

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