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## Recent developments on axion searches at LNF

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The Low-Energy Frontier of Particle Physics [1] provided a well motivated case for physics at the subelectronvolt scale that inspired the design and realization of several experiments within the reach of small and medium laboratories.

At the National Laboratories of Frascati [2] (LNF), the interest in the dark sector first started at the KLOE experiment [3] with the search of light vector-mediators produced in  $e+e-$  collisions at 1 GeV, and continues today with the PADME experiment [4], that looks for dark photons with a positron-beam dump experiment, the second Sikivie's haloscope of the QUAX experiment, and a proposal for a large haloscope [5, 6], FLASH, for searches of axions, dark photons and high-frequency gravitational waves at 100 MHz.

We will discuss the commissioning of the second QUAX haloscope, operating at about 9 GHz, the perspectives for the next few years run and the results of the ongoing R&D, needed to increase the haloscope sensitivity, on quantum amplifiers, microwave-photon counters and superconducting cavities.

Then, we will discuss the status of the FLASH-haloscope proposal and present the updated sensitivities to axions, dark photons and HFGW. The proposal is based on the recycling of the FINUDA magnet, a superconducting solenoid of 1.4 m radius, 2.2 m length and 1.1 T field.

The refurbishing and commissioning of the magnet started and we expect to conduct a cooling test within the year.

[1] J. Jaeckel and A. Ringwald, *Annu. Rev. Nucl. Part. Sci.* 60, 405 (2010).

[2] C. Gatti et al., *Universe* 7, 10.3390/universe7070236 (2021).

[3] A. A. et al., *Physics Letters B* 750, 633 (2015).

[4] K. Dimitrova, *Instruments* 6 (2022).

[5] C. Gatti et al., arXiv:1811.06754 (2018).

[6] D. Alesini et al., arXiv:1911.02427 (2019).

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