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Developments of Microresonators Detectors for Neutrino Physics in Milano

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Low temperature detectors have proven that they are suitable for energy spectrometry. Nowadays one of the most current issue is to increase the number of detectors. Superconducting microwave microresonators are low temperature detectors which are compatible with large-scale multiplexed frequency domain readout. We aim to adapt and further advance the technology of microresonator detectors to develop new devices applied to neutrino physics. More specifically, our purpose is the development of detector arrays for a direct and calorimetric measurement of the neutrino mass from Ho-163 electron capture (Q ~ 2-3 keV) . In order to achieve these goal, we need to find the best design and materials for the detectors. A recent advance in microwave microresonator technology was the discovery that some metal nitrides, such as TiN, possess properties consistent with very high detector sensitivity. We plan to investigate nitrides of higher-Z materials, for example TaN and HfN, that are appropriate for containing the energy of keV decay events, exploring the properties relevant to our detectors, such as quality factor, penetration depth and recombination time.
In this contribution we present the first results obtained from our TiN detectors.

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