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Review of achievements in the development of two-phase emission detector technology and setting up experiments in modern particle physics

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The technology of two-phase emission detectors has been introduced into experimental practice at MEPhI 50 years ago. This type of detectors is extremely sensitive to ionization (down to individual electrons), can be used in very massive (on the scale of hundreds of tons) detectors in order to provide high count rate for quite rare events and organize an active shielding from natural radioactivity in the wall-less configuration of the readout systems. Emission detectors have found their unique application in the most sensitive at the moment experiments searching for cold dark matter in the form of weakly interacting massive particles (WIMPs), accelerator neutrino physics, searching for neutrino less double beta decay search and observing elastic coherent scattering of reactor neutrinos off atomic nuclei. Future prospects will be discussed.

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