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Hyperfine spectroscopy of the $1s_5-2p_9$ transition - another step towards the implementation of ATTA for ^{39}Ar

The main challenge in the measurement of the hyperfine structure of the $1s_5-2p_9$ transition in ^{39}Ar was the thorough elimination of different background contributions. The method that proved to be most suitable for resolving the spectral lines was frequency modulation transfer spectroscopy. The measurement of the hyperfine spectrum of ^{39}Ar is primarily relevant with respect to the implementation of a new atom-optical method for measuring radioactive tracers, namely atom trap trace analysis (ATTA). Radioactive tracers are a very useful tool in environmental physics as they can be applied in many fields such as hydrology and glaciology.

