Potential Applications of Atom Trap Trace Analysis

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A new method of ultrasensitive trace-isotope analysis, based on the techniques of laser cooling and trapping, has recently been used to detect the rare ^{81}Kr (isotope abundance $\sim$ 10-12) atoms in atmospheric krypton samples [1]. This method can be used to analyze many other isotope tracers for a wide range of applications including measuring solar neutrino flux, searching for exotic particles, tracing atmospheric and oceanic currents, archeological and geological dating, monitoring bone-loss rates in the diagnosis and treatment of osteoporosis, monitoring fission products in the environment for nuclear waste management, etc. We will discuss these potential applications at this poster.

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[1] C.Y. Chen et. al., *Science* **286** 1139 (1999).