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## Development of polarized sources based on molecular photodissociation

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Molecular photodissociation is an innovative method for the preparation of polarized atoms and molecules. It is a fundamental chemical process that involves the absorption of one or more polarized photons by a molecule including its fragmentation into polarized atomic (or molecular) fragments. Recently, T. P. Rakitzis' group produced high densities of spin polarized hydrogen atoms applying molecular photodissociation to hydrogen halides. The obtained densities ( $10^{19} \text{ cm}^{-3}$ ) and short production times (ns timescales) surpass by several orders of magnitude conventional methods such as spin-exchange optical pumping and Stern-Gerlach spin separation. These density and time regimes make it an ideal candidate for a broad range of applications, e.g. laser-induced acceleration from polarized gas targets and polarized five-nucleon fusion reactions (D-T, D- $^3\text{He}$ ). The second has been shown to have an increased cross section by  $\sim 50\%$  compared to the unpolarized case.

### Category

Polarized Sources

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