Title:	Experiments on saturated absorption in atomic vapour
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Keywords:	Physics Atomic vapour
Issue Date:	28-Sep-2019
Publisher:	IISERM
Abstract:	This project primarily involved experiments on saturation absorption spectroscopy of rubidium atoms. The first one is the measurement of the hyperfine spectrum of rubid- ium at room temperature using the technique of saturated absorption spectroscopy. At room temperature, the Doppler broadening due to the thermal velocity of the atoms in the spectrum of electronic transitions of rubidium results in a width of ⇠500 MHz; this is much larger than the hyperfine splitting between excited states which are all <300 MHz (although the ground state hyperfine splitting can be ⇠ 3 or 6 GHz). Saturated absorption is a technique that uses two counter-propagating laser beams at the same frequency, resulting in reduction of absorption in the region of the absorption spectrum corresponding to atoms at rest; thus allowing for resolution of all hyperfine transition lines at room temperature.
URI:	IISERM (IISERM) http://hdl.handle.net/123456789/1177 (http://hdl.handle.net/123456789/1177)
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