6.8 Application of Absorption Measurements to the Temperature Determination of a Cloud of Cold Cesium Atoms

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The temperature of a cloud of about 10^8 cold Cesium atoms in a magneto-optical trap has been determined with absorption measurements. On switching off the cooling laser, the atoms fall under gravity. The probe beam comes from a laser that is stabilized on the top of a dopplerfree saturated absorption line of a principal transition of Cesium. This laser serves to record absorption of the free falling atoms passing the probe beam positioned below the trapped cloud. By analysing the signal as a function of time and falling distance a cloud temperature of 1 mK has been determined.