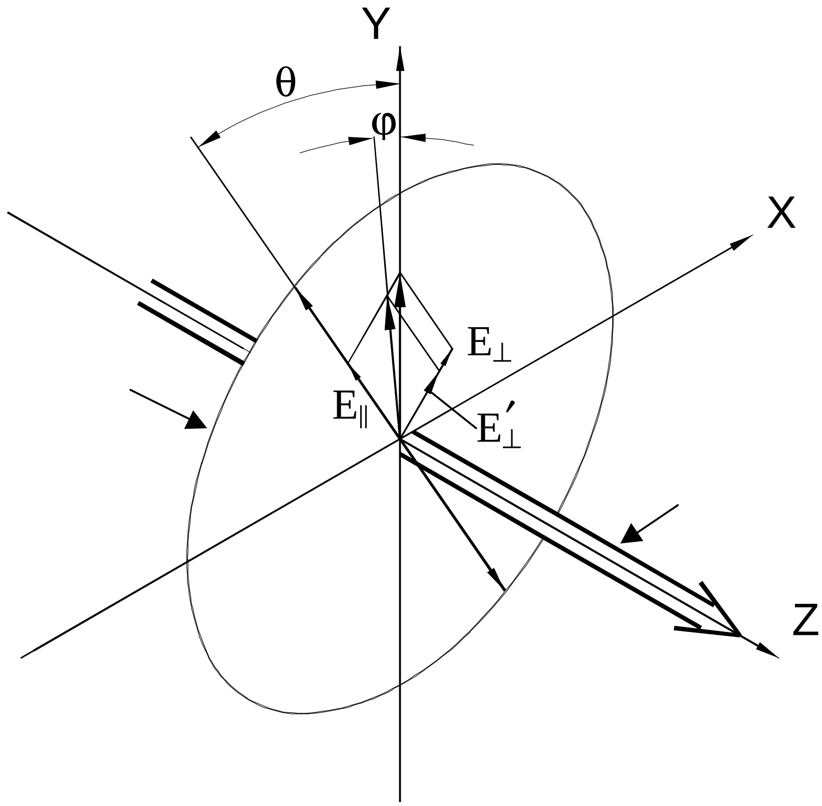

Fig. 5. An optically thin sample of aligned atoms precessing in a magnetic field can be thought of as a thin rotating Polaroid film, which is transparent to light polarized along its axis ($E_{\parallel}$), and slightly absorbent for the orthogonal polarization ($E_{\perp}$). The effect of such "polarizer" is to rotate light polarization by an angle $\varphi \propto \sin(2\theta)$.

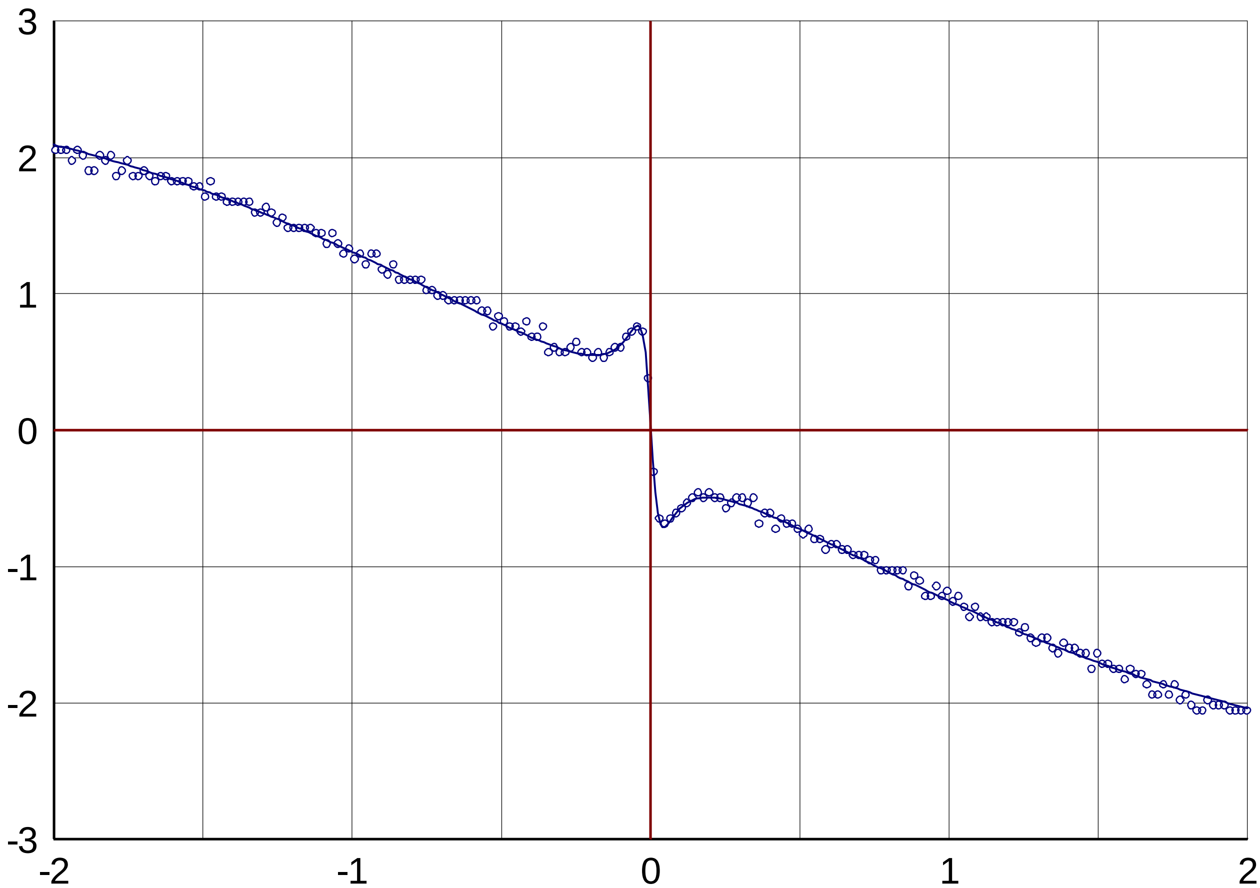

Fig. 6. Optical rotation dependence on the longitudinal magnetic field. The broader (clipped) resonance corresponds to the hole-burning effect, while the narrower resonance is due to the coherence effect with effective relaxation due to atoms' transit across a laser beam (effective diameter ~3 mm). Laser power: 15 μW (the optical pumping saturation power is ≈150 μW; the magnitude of the rotation increases with power approximately linearly up to the saturation power). An additional resonance can be seen in a detailed scan of the near-zero magnetic field region (see Fig. 7). The solid line is a fit to a theoretical lineshape described in the text.