

Polarization spectroscopy and magnetically-induced dichroism of the potassium D2 lines

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We study modulation-free methods for producing sub-Doppler, dispersive line shapes for laser stabilization near the potassium D2 transitions at 767 nm. Polarization spectroscopy is performed and a comparison is made between the use of a mirror or beam splitter for aligning the counter-propagating pump and probe beams. Conventional magnetically-induced dichroism is found to suffer from a small dispersion and large background offset. We therefore introduce a modified scheme, using two spatially separated pump-probe beam pairs. Finally we compare our results to methods using phase modulation and heterodyne detection.

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