Beatlock documentation

Yijun Jiang

11/04/2015

We use an ECDL (Toptica DL100) to do high-field imaging at ~900 G, which translates to a Zeeman shift of ~1.2 GHz.

The beatlock stabilizes the frequency of the ECDL at ~1 GHz redder than the Vortex laser, which is already locked. The rest of the frequency shift is done by an AOM.

The optical diagram of the beatlock is shown in Fig.1.

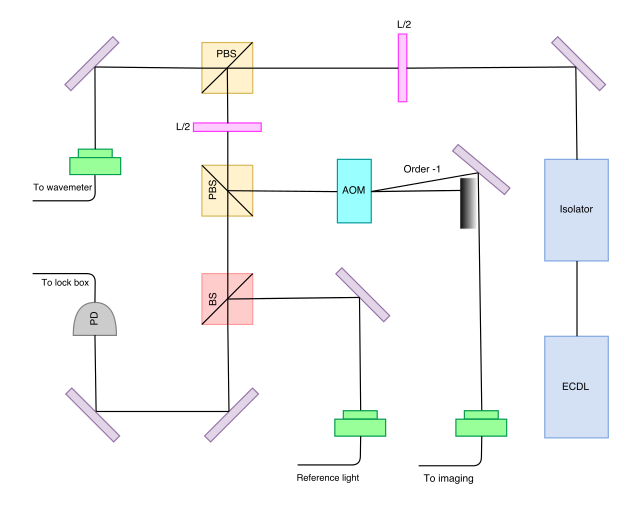


Fig.1. Optical diagram of the beatlock setup.

The lock works as follows:

(1) The reference light and the ECDL light are combined by a non-polarizing beam splitter. Half of the power is lost, which cannot be avoided since we want the two beams being mixed to have the same polarization.

(2) The interference signal (beat) is picked up by a fast photodiode (ET-2030A, 2 GHz amplified photodetector by EOT)

(3)