

Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Co- and Counter- propagating fields in an four level ‘N-scheme’¹

FRANK A. NARDUCCI, JON P. DAVIS, Naval Air Systems Command — A four level “N-scheme” atomic system consists of a standard Λ EIT configuration with an additional level being driven by an additional switch field. We theoretically extend our earlier studies of this model to include a counter-propagating, weak probe field. We investigate the dispersion experienced by the weak probe under a variety of conditions including cold and warm samples, as well as weak and strong switching fields. We find conditions in which the forward propagating probe field experiences normal dispersion while the backward propagating field experiences negative dispersion. We examine regions of high dispersion with vanishing absorption. We discuss applications of our results to high-dispersion gyroscopes.

¹Supported by an In-house Applied Research (IAR) Grant

Frank A. Narducci
Naval Air Systems Command

Date submitted: 26 Jan 2012

Electronic form version 1.4