

DOUBLE BEAM OPTICALLY PUMPED MAGNETOMETER

ABSTRACT

A magnetic field strength measurement system including: a vapor chamber
5 holding alkali metal vapor; a light source unit configured to supply a first circularly
polarized light beam and a second circularly polarized light beam to the vapor chamber,
the first circularly polarized beam and the second circularly polarized beam having
opposite circular polarization; a retroflection unit including at least one optical element
and configured to return the first circularly polarized beam and the second circularly
10 polarized beam to the vapor chamber, reversing direction, while maintaining polarization,
of the first circularly polarized beam and the second circularly polarized beam; at least
one detector configured to measure light associated with the first circularly polarized
beam and the second circularly polarized beam emitted from the vapor chamber and to
produce at least one measurement signal; circuitry configured to: provide a modulating
15 signal to the light source unit, the modulating signal configured to modulate the first
circularly polarized beam and the second circularly polarized second beam; receive the at
least one measurement signal from the at least one detector; and determine a magnetic
resonance frequency using one or both of the modulating signal and the at least one
measurement signal.

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[Figure 1A]