ATOMIC CLOCK SYSTEM WITH IMPROVED SERVO SYSTEM

ABSTRACT

An improved atomic beam clock apparatus and method are disclosed. The invention substantially reduces errors arising from Rabi pulling and variations in the frequency standard resulting from variations in the amplitude of the microwave signal used to excite the atomic beam. The invention includes a servo loop that adjusts both the microwave frequency and amplitude. The servo loop measures the output of a beam detector at two pairs of microwave frequencies. The output of the detector at each frequency in each pair of frequencies is measured for two different microwave amplitudes. The amplitude data is used to adjust the microwave power such that the output of the detector is maximized at each pair of frequencies. The amplitude modulation scheme of the present invention may also be applied very advantageously to conventional two point frequency modulation schemes.

(Fig. 1)

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