

Title (en)  
METHOD AND SYSTEM FOR OPERATING A LASER SELF-MODULATED AT ALKALI-METAL ATOM HYPERFINE FREQUENCY

Title (de)  
VERFAHREN UND SYSTEM ZUM SELBSTMODULIERTEN BETRIEB EINES LASERS BEI ALKALIMETALLATOM-HYPERFEINFREQUENZ

Title (fr)  
PROCEDE ET SYSTEME D'EXPLOITATION D'UN LASER AUTO-MODULE A UNE FREQUENCE HYPERFINE D'ATOME DE METAL ALCALIN

Publication  
**EP 1815588 A4 20100303 (EN)**

Application  
**EP 05857002 A 20051122**

Priority

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- US 63002404 P 20041122
- US 5226105 A 20050207
- US 28406405 A 20051121

Abstract (en)  
[origin: WO2006073597A2] The present invention provides a method and apparatus for making atomic clocks or atomic magnetometers as self-modulated laser systems based on the physics of push-pull optical pumping. An atomic vapor cell is required to be in the laser cavity. With proper conditions, spontaneous push-pull optical pumping can occur inside the laser cavity. This causes the laser beam to be modulated at hyperfine-resonance frequency. With a fast photodetector, the modulated laser signal can be converted into the electrical signal, which serves as the atomic clock ticking signal or magnetometer signal. The self-modulated laser system does not use any local oscillator and the microwave circuit to lock the oscillator frequency to the hyperfine-resonance frequency, and therefore can consume less power and become more compact than conventional systems. This invention will benefit applications of time measurements and magnetic-field measurements.

IPC 8 full level  
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Citation (search report)

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- See references of WO 2006073597A2

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