43. The magnetometer of claim **40** wherein an electric field of the pumping light inside the vapor cell is alternating its polarization at the hyperfine frequency.

44. The magnetometer of claim **40** wherein photon spin of the pumping light inside the vapor cell is oscillating synchronously with electron spin oscillation or precession of the atoms.

45. The magnetometer of claim **40** wherein the photonic gain media is a type of electronically pumped semiconductor.

46. The magnetometer of claim **15** wherein the electronically pumped semiconductor is an emitting laser diode.

47. The magnetometer of claim **40** wherein the photonic gain media is a type of optically pumped gain media.

48. The magnetometer of claim **47** wherein the optically pumped gain media is a dye or a crystal.

49. The magnetometer of claim **15** further comprising:

means for using said output modulated light for measuring a magnetic field.

50. A method of generating a hyperfine-frequency stabilized light source comprising the steps of:

a) providing a self-modulating laser comprising gain media and a vapor cell within a laser cavity; and

b) exciting hyperfine transitions of atoms within said vapor cell by pumping them with light from said laser modulated at a hyperfine frequency.

51. The method of claim **50** further comprising the step of:

using an optical comb of output modulated light from step b) for stabilizing an optical frequency of one peak of the optical comb.

52. The method of claim **51** wherein the optical frequency, f_n, of the comb peak is stabilized by the step of feedback controlling the laser cavity to obtain $f_n = n\nu_h$, wherein n is an integer number, and ν_h is the hyperfine frequency.

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