14. A method of stabilizing the phase of a carrier wave signal with respect to an envelope of the pulses emitted by a mode-locked pulsed laser comprising:

obtaining an optical output from said pulsed laser that has a bandwidth that spans less than one octave;

separating a first frequency output from said optical output having a first frequency;

separating a second frequency output from said optical output, having a second frequency;

multiplying said first frequency output of said pulsed laser by an integer value N that is at least equal to 2 to produce a frequency multiplied first output;

multiplying said second frequency output of said pulsed laser by N−1 to produce a frequency multiplied second output;

shifting said frequency multiplied second output by a predetermined amount to produce a frequency multiplied second frequency shifted output;

combining said frequency multiplied first output and said frequency multiplied second frequency shifted output to obtain a beat frequency signal;

detecting said beat frequency signal;

generating said beat frequency signal to phase coherently stabilize said phase of said carrier wave signal relative to said envelope of said pulsed laser.

15. The method of claim 1, 4, or 14 wherein said step of using said beat frequency signal to stabilize said phase of said carrier wave signal relative to said envelope of said pulsed laser further comprises:

generating control signals in response to said beat frequency to modify the optical cavity of said pulsed laser to change the velocity of said envelope and said carrier wave signal in said optical cavity.

16. The method of claim 15 wherein said step of modifying said optical cavity of said pulsed laser further comprises:

inserting prisms in said optical cavity that spatially disperse the spectrum of said carrier wave signal;

translating at least one of the mirrors of said laser cavity in response to said control signals;

tilting the mirror in said laser cavity that reflects said spatially dispersed spectrum in response to said control signal.

17. The method of claim 1, 4, or 14 wherein said predetermined amount is coherently derived from the repetition frequency of said pulsed laser.

18. The method of claim 1, 4, or 14 wherein said step of obtaining an optical output from said pulsed laser further comprises broadening said optical output from said pulsed laser using an optical fiber located externally from said optical cavity of said pulsed laser.

19. The method of claim 1, 4, or 14 wherein said step of obtaining an optical output from said pulsed laser further comprises generating a broadened optical output from said pulsed laser.

20. The method of claim 14 wherein said step of shifting said frequency multiplied second frequency output by a predetermined amount to produce a frequency multiplied second frequency shifted output further comprises applying an adjustable frequency input signal to an acousto-optic modulator that adjusts said frequency multiplied second frequency shifted output by a fractional portion of the repetition frequency of said envelope.

21. The method of claim 14 wherein said step of shifting said frequency multiplied second frequency output by a predetermined amount to produce a frequency multiplied second frequency shifted output further comprises applying an adjustable electric signal to an electro optic modulator.

22. A mode-locked pulsed laser system that stabilizes the phase of a carrier wave signal with respect to an envelope of the pulses emitted by said mode-locked pulsed laser system comprising:

a mode-locked pulsed laser that generates an optical output said pulsed laser having an optical cavity;

a beam splitter that separates a first frequency signal from said optical output, said first frequency signal having a first frequency, from a second frequency signal of said optical output, said second frequency signal having a second frequency;

a first frequency multiplier aligned with said first frequency signal that multiplies said first frequency signal by an integer value N that is at least equal to 2 to produce a frequency multiplied first signal;

a second frequency multiplier aligned with said second frequency signal that multiplies said second frequency signal by N−1 to produce a frequency multiplied second signal;

a frequency shifter aligned with said frequency multiplied second frequency signal that frequency shifts said frequency multiplied second frequency signal by a predetermined amount to produce a frequency multiplied second frequency shifted signal;

a beam combiner that combines said frequency multiplied first signal and said frequency multiplied second frequency shifted signal to obtain a beat frequency signal;

a detector aligned to detect said beat frequency signal;

a control signal generator that generates control signals in response to said beat frequency signal;

a servo-controller that modifies an optical cavity of said pulsed laser in response to said control signals to change relative velocity between said envelope and said carrier wave signal in said optical cavity.

23. The system of claim 22 further comprising a nonlinear self-phase modulator that broadens the bandwidth of said optical output to produce said predetermined bandwidth.

24. The system of claim 9, 10, or 22 wherein said beam splitter comprises:

a dichroic mirror.

25. The system of claim 9, 10, or 22 wherein said frequency shifter comprises:

an acousto-optic modulator.

26. The system of claim 9, 10, or 22 wherein said control device comprises:

carrier-envelope phase locking electronics.

27. The system of claim 9, 10, or 22 wherein said detector comprises:

an avalanche photodiode.

28. The system of claim 9, 10, or 22 wherein said servo-controller comprises:

a piezoelectric transducer tube that provides both tilt and translation.

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