CLAIMS

1. A fiber laser comprising:

   a frequency-broadened narrowband seed source, comprising a narrowband seed source having a spectral width of less than 10GHz, wherein an output of the narrowband seed source is broadened to a spectral width of less than 50GHz,

   a depolarizer coupled to an output of the frequency-broadened narrowband seed source and configured to provide a depolarized output, wherein the depolarized output is depolarized on time scales shorter than 50ns, and

   at least one amplifier coupled to an output of the depolarizer, wherein the amplifier is configured to receive and amplify the depolarized output; and

   an optical fiber configured to receive the amplified radiation from the at least one amplifier, wherein the optical fiber comprises at least one segment of a polarization maintaining (PM) fiber having at least two optical axes, wherein the at least one PM fiber segment is configured to split received depolarized radiation between the at least two optical axes thereof.
2. The fiber laser of claim 1, wherein the frequency-broadened seed source comprises a single frequency source which is broadened by a temporal modulation.
3. The fiber laser of claim 2, wherein the frequency-broadened seed source comprises a frequency-swept narrow-band distributed feedback (DFB) diode.
4. The fiber laser of claim 3, wherein a frequency of the DFB diode is swept by current modulation.
5. The fiber laser of claim 2, wherein the frequency-broadened seed source comprises a phase modulator configured to modulate a phase of the source radiation.
6. The fiber laser of claim 1, wherein the depolarizer comprises an optical interferometer configured to depolarize a polarized input thereto.
7. The fiber laser of claim 6, wherein the interferometer is of a Mach-Zehnder or a Lyot type.
8. The fiber laser of claim 1, wherein the depolarizer comprises an optical frequency shifting interferometer configured to modify, spectrally, a wavelength of the amplified radiation in one arm of the interferometer.
9. The fiber laser of claim 8, wherein the interferometer is of a Mach-Zehnder or a Lyot type.
10. The fiber laser of claim 1, wherein the at least one amplifier is further configured to amplify the depolarized output to over 10W.

11. The fiber laser of claim 1, wherein the frequency-broadened seed source comprises at least two seeds with orthogonal polarizations.
12. The fiber laser of claim 1, wherein the at least one amplifier comprises at least one semiconductor optical amplifier (SOA).
13. The fiber laser of claim 1, further comprising an optical fiber connecting the seed source, the depolarizer and the at least one amplifier.
14. The fiber laser of claim 13, wherein the at least one PM fiber segment is located between stages of the at least one amplifier.
15. The fiber laser of claim 13, wherein the at least one PM fiber segment is located at an exit of the at least one amplifier.
16. The fiber laser of claim 13, wherein the at least one PM fiber segment comprises a plurality of PM fiber segments, spliced to form angles between their respective optical axes.
17. The fiber laser of claim 1, wherein at least one of the at least one amplifier comprises an active PM fiber.
18. A laser system comprising:

    a plurality of the fiber lasers of claim 1,

    at least one optical element configured to combine outputs of the fiber lasers, and

    at least one polarization insensitive grating configured and set to generate an output beam from the combined outputs of the fiber lasers.
19. The laser system of claim 18, wherein the at least one grating comprises a reflective grating.
20. The laser system of claim 18, wherein the at least one grating comprises a transmission grating.