



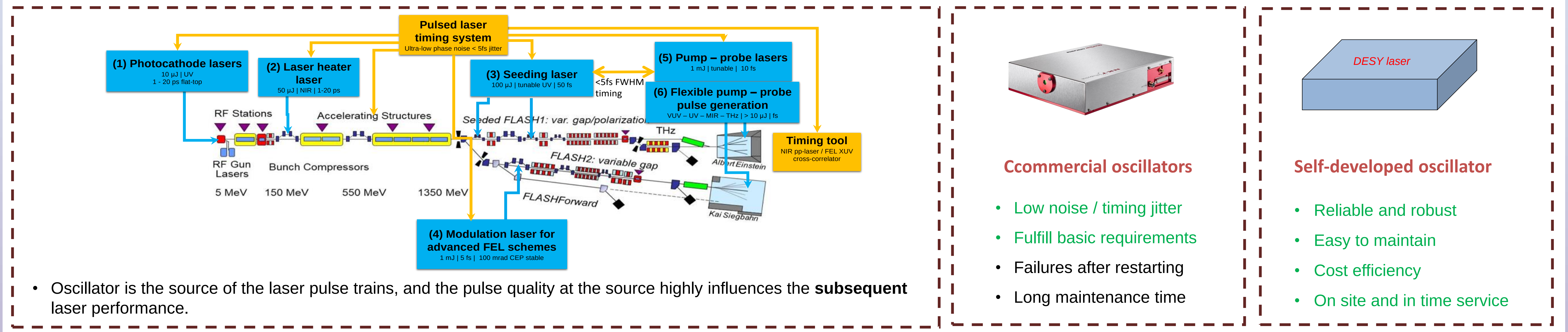
Compact, all-PM fiber integrated and alignment-free ultrafast Yb: fiber NALM laser with sub-femtosecond timing jitter

Yuxuan Ma¹, Sarper H. Salman^{1,4}, Chen Li¹, Christoph Mahnke¹, Yi Hua^{1,*}, Stefan Droste^{1,3}, Jakob Fellerger², Aline S. Mayer², Oliver H. Heckl², Christoph M. Heyl^{1,4}, and Ingmar Hartl¹

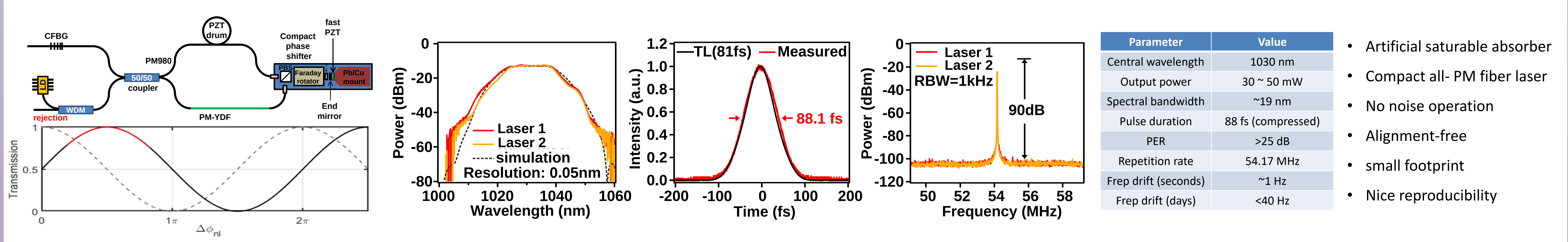
¹ Deutsches Elektronen-Synchrotron DESY, 22607 Hamburg, Germany
² Faculty Center for Nano Structure Research, Faculty of Physics, University of Vienna, 1090 Vienna, Austria
³ The Linac Coherent Light Source, SLAC National Accelerator Laboratory, 2575 Sand Hill Rd, Menlo Park, CA 94025, USA
⁴ Helmholtz-Institute Jena, 07743 Jena, Germany

*Author E-mail address: yi.hua@cfel.de

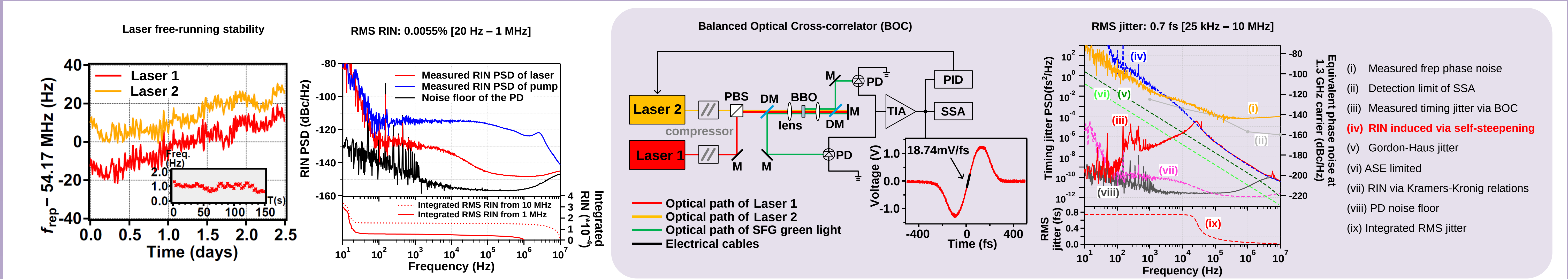
Motivation



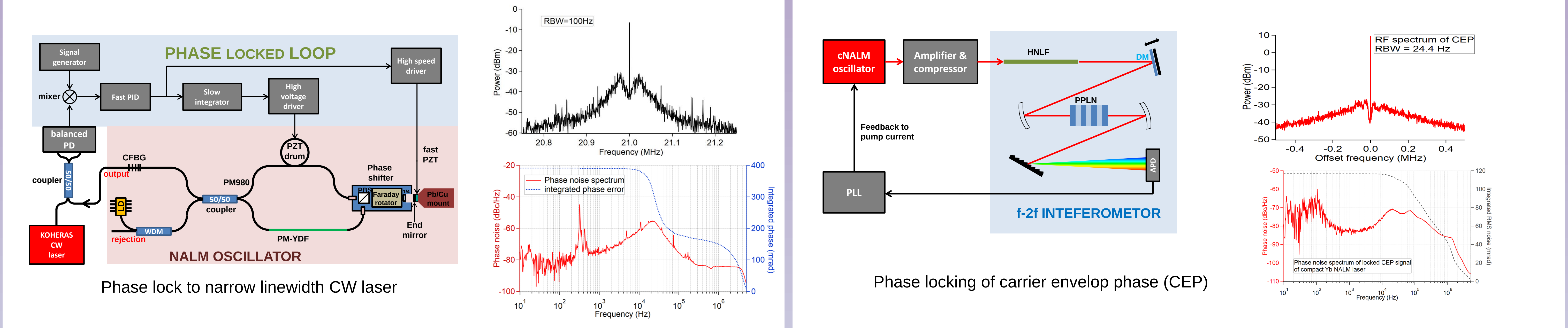
Compact NALM oscillator [1,2]



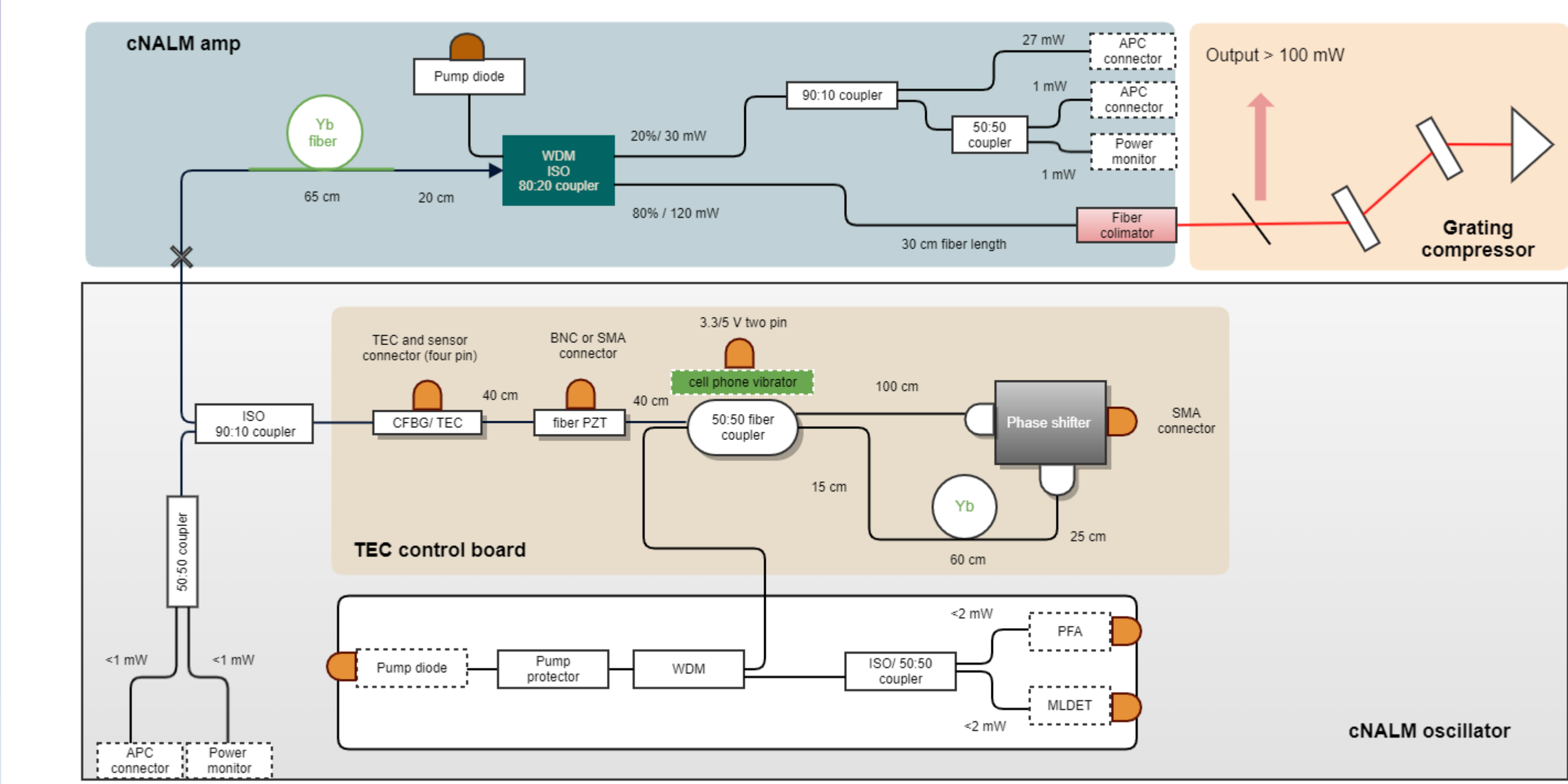
Laser stability, intensity noise and timing jitter [2]



Application on optical frequency comb

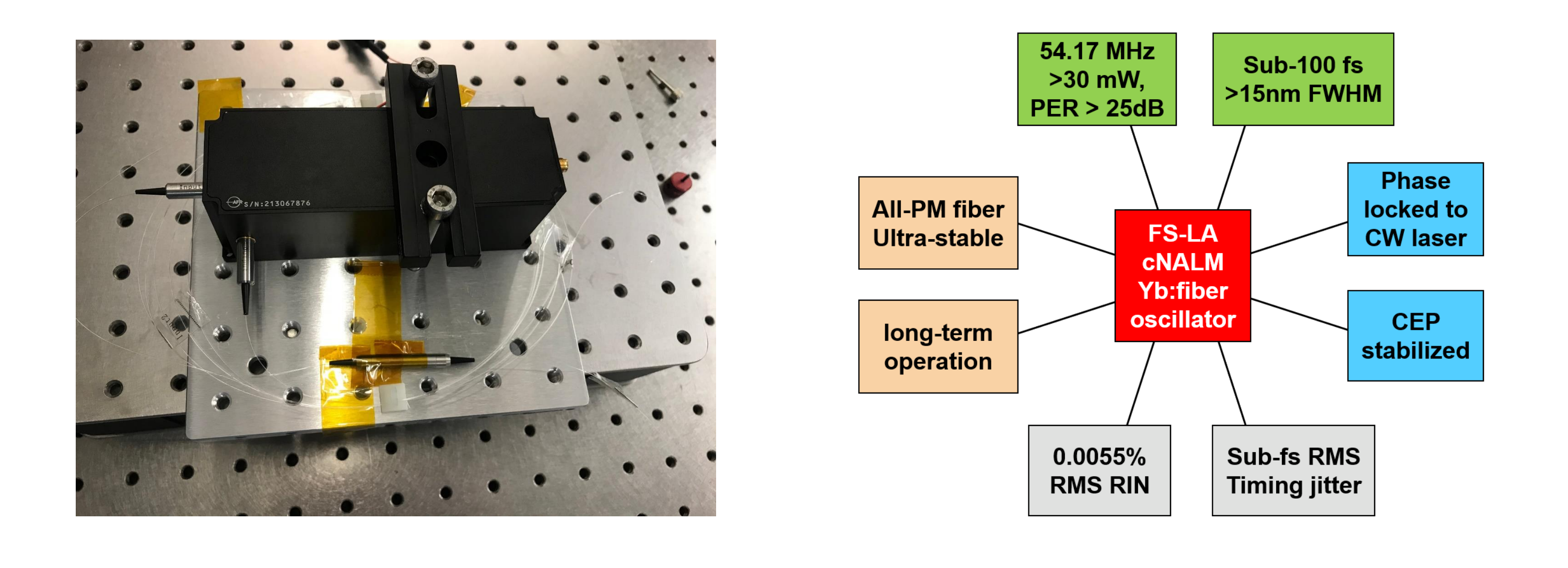


Future developing plan



- Fully frequency stability NALM Laser with low timing jitter
- Delivering two pulse trains: >100 mW transform limited pulse (100 fs) ; 4-ps, 20-mW pulse

Conclusion



Reference

- Fermann, Martin E., et al. "Nonlinear amplifying loop mirror." Optics Letters 15.13 (1990): 752-754.
 - Ma, Yuxuan, et al. "Compact, all-PM fiber integrated and alignment-free ultrafast Yb: fiber NALM laser with sub-femtosecond timing jitter." arXiv preprint arXiv:2101.02920 (2021).
- JLT: DOI: [10.1109/JLT.2021.3070208](https://doi.org/10.1109/JLT.2021.3070208)