

Press Release

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FC1500-Quantum: Complete solution for cold atom applications

Optical clocks and various types of quantum simulators and computers rely on the technology of cold atoms or ions. These applications typically use a system of several highly stable cw lasers for trapping and cooling of the atoms. The particular lasers spectroscopically address the respective optical transitions within the atoms or ions. Such complex systems generally imply high demands on the experimental design and the apparatus.

With its new FC1500-Quantum, Menlo Systems offers a complete laser system for a plentitude of different atomic species and scenarios, such as e.g. for strontium lattices or calcium ions. Within three 19-inch racks, all integrated cw lasers are stabilized by the use of an optical frequency comb and are coupled to the experiment via optical fibers. A sub-Hz linewidth laser, which is stabilized to an optical cavity of ultrahigh finesse, serves as reference for the ultralow noise frequency comb. The comb transfers the spectral purity of the cavity to all lines of its spectrum, which themselves then serve as reference for all lasers needed. The entire system is controlled via central software.

In the example of a laser system for an optical strontium lattice clock the cavity stabilized laser at 1.5 μm wavelength provides a linewidth below 1 Hz, which the optical frequency comb transfers into the entire visible and infrared spectrum. In total seven cw lasers are stabilized to the narrow comb lines, of which the clock laser at 698 nm is stabilized with sub-Hz linewidth. All lasers are directly available as a time saving complete solution.



Figure: Laser system for an optical strontium lattice clock.

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About Menlo Systems:

Precision in Photonics. Together we shape light.

Menlo Systems GmbH is a leading developer and global supplier of instrumentation for high-precision metrology. The company with headquarters in Martinsried near Munich is known for its Nobel Prize winning optical frequency comb technology. With subsidiaries in the US and China and a global distributor network, Menlo Systems is closely connected to its customers from science and industry. The main product lines are optical frequency combs, time and frequency distribution, terahertz systems, ultrafast and ultrastable lasers,

and corresponding control electronics. Besides standard production, Menlo Systems develops and manufactures custom made solutions for laser-based precision measurements.