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Press Release

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NEW: Versatile Function Generator Launched for Next Generation of Phase Coherent Experiments

Much more than just an arbitrary waveform generator is required for modern atomic physics experiments

Based on latest Direct Digital Synthesizer (DDS) and Field Programmable Gate Array (FPGA) technology, TOPTICA offers with the Versatile Function Generator VFG 150 not only another 150 MHz arbitrary waveform generator but a novel approach to phase-controlled, coherently driven experiments in atom, ion and condensed matter physics. Exploitation also in other fields is encouraged.

Unlike arbitrary waveform generators, which are limited by their internal memory, the VFG 150 can emit infinitely long signal radiofrequency (rf) signal trains with very high complexity. Key features are:

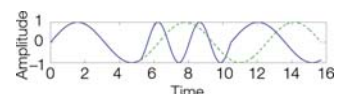
- Phase-continuous and phase-coherent frequency switching modes, frequency range 1 .. 150 MHz
- Standard waveforms: sine, the versatile modulation capabilities allow for easy implementation of special wave forms like Blackman, Gaussian or chirped pulses
- Infinitely-long random sequences, not limited by storage capacity, due to USB 2.0 computer interface with streaming capability

Phase-controlled frequency switching of rf signals

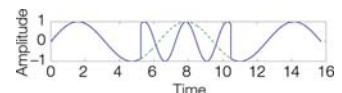
The VFG 150 allows to predetermine the amplitude, frequency and phase of its sinusoidal output with a dwell time down to 5 ns. Two frequency switching modes are available. Phase-continuous switching preserves the actual phase when changing from one frequency to another. In phase-coherent mode, the phase at the switching time is set such that the new frequency oscillates in phase with a any "virtual" radio frequency started at the beginning of the experimental sequence. Additionally, a user-defined phase offset is available, which allows to maintain the phase information of



Versatile Function Generator - VFG 150



Phase-continuous switching. The phase of the output signal after switching back from an intermediate frequency to the initial frequency is different from its initial phase, leading to a smooth amplitude change without discontinuities.



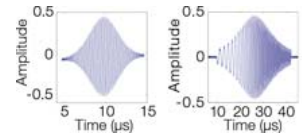
Phase-coherent switching. Even when switching back and forth between various frequencies the phase of each frequency is preserved. Additionally a user controlled phase offset can be added.

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a given frequency all the time. Most complicated pulse designs can be realized. Integration into the experimental set-up is easy using the reference frequency and trigger input.

The VFG 150 has been developed in conjunction with the group of Prof. Christoph Wunderlich at the University Hamburg and Siegen where it has been extensively applied already in cold atom and ion trapping work.



Gaussian pulses, chirped pulses, Blackman pulses, etc.

TOPTICA Photonics AG develops, manufactures, services and distributes technology-leading diode and fiber lasers and laser systems for scientific and industrial applications. Sales and service is offered worldwide through TOPTICA Germany and its subsidiary TOPTICA USA, as well as all through 13 distributors. A key point of the company philosophy is the close cooperation between development and research to meet our customers' demanding requirements for sophisticated customized system solutions and their subsequent commercialization.

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