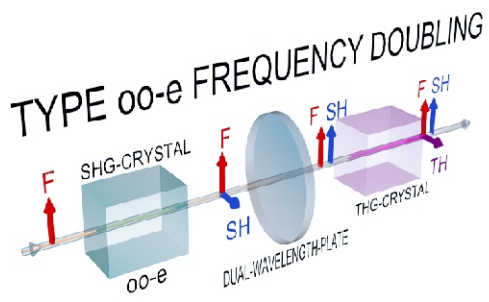
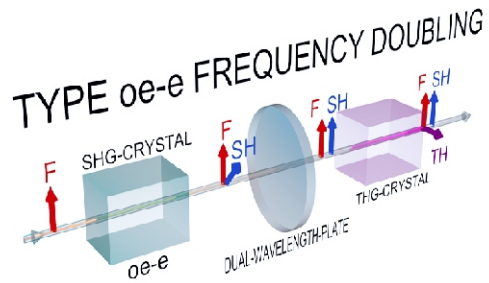
DUAL WAVELENGTH ZERO-ORDER PHASE RETARDATION PLATES *DUAL WAVE*

for efficient frequency tripling of femtosecond light pulses





Features:

true zero order at both fundamental and second harmonic

broad bandwidth (typically 100 nm)

phase retardation:

/2 at the fundamental

at the second harmonic

wavelength regions:

150 nm - 6000 nm (type UVIR)

0.8 μm - 21 μm (type FIR)

Applications:

frequency tripling

femtosecond third harmonic generation

differential polarization rotation

Efficient frequency-tripling of laser light requires rotation of the polarization plane of the fundamental F or the second harmonic SH after the frequency doubling crystal in order to make the planes parallel for efficient interaction in the frequency tripling crystal.

The polarization planes are made parallel by using a special dual-wavelength waveplate that introduces a phase retardation equal to /2 for F (measured in wavelength units), and for the second harmonic. By rotating the waveplate, the polarization plane of the second harmonic remains unchanged, while that of the fundamental is rotated in order to make the polarization planes parallel for the frequency tripling. The conventional dual-wavelength quartz plates are designed for a single pair of wavelengths F and SH and have very narrow spectral bandwidth due to the multiple-order design.

As a unique and universal solution, ALPHALAS GmbH introduces the Dual-Wave® Tunable True-Zero-Order DUAL-WAVELENGTH Phase Retardation Plate. The differential phase retardation is achievable for *an arbitrary pair of wavelengths* (fundamental and second harmonic) in an extremely broad wavelength region. Thus, the new dual-wavelength waveplate is extremely universal with respect to the wavelength ranges. Another important advantage is the *true-zero order feature* that makes these waveplates indispensable for use with femtosecond and broadband or tunable laser sources.

The new Dual-Wave® phase retardation plate is a basic component of our femtosecond frequency tripling unit FEST-01 that provides the highest frequency tripling efficiency on the market. The waveplate design is protected by a patent application.

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