**Optical phonons in the kesterite Cu2ZnGeS4 semiconductor: polarized Raman spectroscopy and first-principle calculations.**

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**Abstract.** A comprehensive vibrational analysis of the kesterite Cu2ZnGeS4 semiconductor (space group I ) is reported, which includes experimental in-plane rotation polarized Raman scattering measurements from the (1 0 1)-single crystal facet as well as first principle lattice dynamic calculations. 17 out of the 27 expected vibrational modes of the kesterite structure are unambiguously identified. Raman scattering measurements performed under resonant excitation conditions show a pronounced enhancement of the longitudinal optical components of the polar modes. The appearance of several additional lines in the Raman spectra have been interpreted as being due to the presence of inclusions of Cu2ZnGeS4 polymorph with the P 2c lattice symmetry, which differs from the kesterite by cation sublattice arrangement.

**Keywords:** Cu2ZnGeS4, kesterite, Raman scattering, lattice dynamic, vibrational modes.

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