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Elasticity and equation of state of orthoenstatite, $MgSiO_3$

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ABSTRACT

Published measurements of the compression and elasticity of $MgSiO_3$ orthoenstatite have been reanalyzed and the estimates that they yield of the room pressure bulk modulus and its pressure derivative are now shown to be consistent with one another. New single-crystal compression data is also consistent with the revised EoS parameters. Combining the results of four different experiments (two compression, one Brillouin measurement, and one in situ high-pressure ultrasonic measurement) yields best estimates of $K_{T0} = 105.8(5)$ GPa and $K'_0 = 8.5(3)$ for a third-order Birch-Murnaghan EoS.