

197 **Table S1.** Experimental results for ferropericlasite ($\text{Mg}_{0.92}\text{Fe}_{0.08}\text{O}$). V_P velocities were derived
 198 from ISS measurements while V_S velocities were from BLS measurements.

| Run 1 | | | | | | | | |
|--------------|------------------------------|---------------------|---------------------|---------------------|---------------------|-----------------|-----------------|-----------------|
| Pressure | Density g/cm ³ | V_P [100] km/s | V_P [110] km/s | V_S [100] km/s | V_S [110] km/s | C_{11} GPa | C_{12} GPa | C_{44} GPa |
| 1.3(0.1) | 3.80 | 8.61(0.08) | 9.52(0.09) | 6.14(0.07) | 4.97(0.06) | 287(8) | 102(9) | 146(8) |
| 8.0(0.1) | 3.95 | 9.21(0.08) | 9.87(0.09) | 6.12(0.07) | 5.46(0.07) | 343(8) | 112(7) | 152(6) |
| 15.6(0.2) | 4.11 | 9.83(0.10) | 10.19(0.09) | 6.17(0.07) | 5.87(0.07) | 403(11) | 123(11) | 159(9) |
| 20.4(0.0) | 4.20 | 10.23(0.07) | 10.42(0.06) | 6.19(0.10) | 6.15(0.06) | 445(12) | 131(12) | 163(10) |
| 25.2(0.3) | 4.28 | 10.56(0.07) | 10.64(0.07) | 6.19(0.10) | 6.47(0.07) | 486(10) | 132(8) | 168(7) |
| 29.9(0.5) | 4.36 | 10.93(0.06) | 10.81(0.07) | 6.15(0.10) | 6.65(0.07) | 527(14) | 144(13) | 168(10) |
| 34.2(0.6) | 4.43 | 11.29(0.07) | 11.02(0.07) | 6.21(0.10) | 6.75(0.09) | 566(20) | 164(22) | 172(16) |
| 38.5(0.8) | 4.49 | 11.50(0.09) | 11.19(0.09) | 6.19(0.10) | 7.03(0.10) | 601(15) | 161(14) | 176(10) |
| 43.1(0.9) | 4.56 | 11.43(0.15) | 11.08(0.07) | 6.12(0.22) | 7.15(0.10) | 607(13) | 146(10) | 176(8) |
| 45.6(1.0) | 4.60 | 11.43(0.12) | 10.94(0.07) | 6.15(0.20) | 7.31(0.10) | 610(14) | 122(9) | 178(9) |
| 49.2(1.2) | 4.67 | 11.05(0.08) | 10.44(0.07) | 6.16(0.20) | 7.49(0.11) | 579(12) | 61(4) | 182(8) |
| 53.3(1.1) | 4.28 | 11.30(0.07) | 10.55(0.06) | 6.17(0.20) | 7.72(0.11) | 616(12) | 55(3) | 176(8) |
| 57.7(1.2) | 4.81 | 11.84(0.10) | 11.01(0.08) | 6.13(0.10) | 8.02(0.11) | 689(19) | 78(12) | 188(14) |
| 61.0(1.5) | 4.86 | 12.11(0.08) | 11.14(0.06) | 6.12(0.15) | 8.13(0.18) | 724(16) | 88(7) | 188(9) |
| 65.2(1.0) | 4.91 | 12.57(0.08) | 11.46(0.07) | 6.14(0.15) | 8.33(0.11) | 786(17) | 109(8) | 190(9) |
| 67.3(0.4) | 4.94 | 12.77(0.13) | 11.76(0.17) | 6.14(0.11) | 8.45(0.20) | 823(24) | 127(18) | 195(16) |
| 70.0(2.0) | 4.97 | 13.00(0.12) | 11.95(0.14) | 6.16(0.11) | 8.49(0.10) | 856(22) | 148(15) | 196(13) |
| 75.0(2.0) | 5.03 | 13.36(0.19) | 12.10(0.19) | 6.11(0.11) | 8.67(0.10) | 909(18) | 159(10) | 194(8) |
| 78.0(2.0) | 5.06 | 13.58(0.20) | 12.30(0.23) | 6.10(0.11) | 8.75(0.21) | 947(20) | 177(11) | 195(9) |
| 83.0(2.0) | 5.12 | 13.74(0.10) | 12.41(0.30) | 6.06(0.11) | 8.94(0.21) | 985(26) | 174(18) | 197(14) |
| 89.0(2.0) | 5.19 | 14.17(0.28) | 12.69(0.40) | 6.03(0.11) | 9.02(0.11) | 1053(24) | 215(17) | 194(11) |
| Run 2 | | | | | | | | |
| 68.7(1.3) | 4.95 | 12.78(0.13) | 11.76(0.07) | 6.13(0.10) | 8.43(0.10) | 826(23) | 130(17) | 195(15) |
| 73.3(1.5) | 5.01 | 13.21(0.10) | 12.07(0.17) | 6.16(0.10) | 8.56(0.14) | 888(19) | 160(12) | 197(10) |
| 76.9(1.1) | 5.05 | 13.49(0.10) | 12.28(0.20) | 6.12(0.10) | 8.67(0.15) | 932(19) | 179(12) | 196(9) |
| 82.1(1.6) | 5.11 | 13.75(0.21) | 12.30(0.30) | 6.13(0.10) | 8.86(0.10) | 973(27) | 174(20) | 195(15) |
| 88.5(1.1) | 5.18 | 14.00(0.25) | 12.70(0.20) | 6.13(0.10) | 8.96(0.10) | 1033(25) | 208(19) | 203(13) |
| 96.4(1.7) | 5.27 | 14.50(0.28) | 13.10(0.20) | 6.10(0.15) | 9.17(0.16) | 1125(27) | 248(21) | 205(13) |

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