Abstract Submitted
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Boson mode, Medium Range Structure and Intermediate Phase (IP) in $(Na_2O)_x(B_2O_3)_{1-x}$ glasses[1] K. VIGNAROOBAN, P. BOOLCHAND, Univ of Cincinnati, M. MICOULAUT, Univ of Paris, M. MALKI, Univ of Orleans — Raman scattering of titled glasses are examined using a T64000 Dispersive system. Scattering strengths of the Boson mode (40 cm^{-1}, 70 cm^{-1}) and the Boroxyl ring (BR) mode (808 cm^{-1}) are found to decrease with increasing x at the same rate in the $0 < x < 20\%$ soda range. Apparently, the 2D character of BRs embedded in a 3D network gives rise to the Boson mode.[2] The triad of modes (705, 740, 770 cm^{-1}) near the 808 cm^{-1} mode are found to display a maximum in scattering strength near x = 37% (705 cm^{-1}), 33% (740 cm^{-1}) and 25% (770 cm^{-1}), suggesting that these are also ring modes of Na-tripentaborate (STPB), Na-diborate (SDB) and Na-triborate (STB) super-structures. Variations in Raman scattering strengths also suggest that STB percolate near x = 20%, the *stress* transition, while the STPB and SDTB percolate near x = 40%, the *rigidity* transition. These transitions were inferred from m-DSC experiments that show an intermediate phase in the $20\% < x < 40\%$ range in dry and homogeneous glasses.

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[2]M. Flores-Ruiz and G. Naumis, PRB, 2011. **83**: p. 184204

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