Spin Peierls transitions within the 1/4-filled Peierls extended Hubbard model R.P. HARDIKAR, R. TORSTEN CLAY, Mississippi State University — We investigate the Peierls transition within the one-dimensional Peierls extended Hubbard model at 1/4 filling. We treat both electron-electron and bond-coupled electron-phonon interactions (finite frequency) exactly using the Stochastic Series Expansion Quantum Monte Carlo method. As previously found for the 1/2-filled band, Peierls distortion for finite-frequency phonons only occurs for electron-phonon coupling above a critical value. Unlike the 1/2-filled band, at 1/4 filling the Peierls transition must be preceded at a higher temperature by another structural or charge order transition. We compare the resulting Peierls transition for two possible high temperature states, either (a) dimerization or (b) $4k_F$ ..1010.. charge order at high temperature.

R.P. Hardikar
Mississippi State University