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Multiple traveling solitons in one-dimensional monatomic quartic lattices SANGHAMITRA NEOGI[1], GERALD MAHAN[2], Department of Physics, The Pennsylvania State University — We discuss the generation of traveling soliton waves in a one- dimensional monatomic quartic lattice using numerical techniques. We apply an external forcing function or a pulse to the end atom of a free chain of monatomic atoms to generate traveling solitons. When the strength of the forcing function is above a threshold value, multiple traveling solitons are observed to flow down the chain. The number of traveling solitons in the chain increases rapidly with the increase in pulse strength beyond this critical value. The amplitudes and velocities of these multiple solitons increase with the increase in pulse strength for small pulse strengths. For larger values of pulse strengths, the amplitudes and velocities of all the multiple solitons saturate. The frequencies and wave vectors of all the traveling solitons on the quartic lattice are within a very narrow range of values. These values are independent of the pulse strength.

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