

## Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Movie 1 of phonon A in **1-d<sub>4</sub>** at 109.2 cm<sup>-1</sup>

File Name: Supplementary Movie 2

Description: Movie 2 of phonon C in **1-d<sub>4</sub>** at 126.0 cm<sup>-1</sup>

File Name: Supplementary Movie 3

Description: Movie 3 of phonon D in **1-d<sub>4</sub>** at 129.3 cm<sup>-1</sup>

File Name: Supplementary Movie 4

Description: Movie 4 of phonon E in **1-d<sub>4</sub>** at 142.7 cm<sup>-1</sup>

File Name: Supplementary Movie 5

Description: Movie 5 of phonon A in **1-d<sub>18</sub>** at 116.3 cm<sup>-1</sup>