

**Table:** Table with the wave propagation speed to the right  $v_R$ , wave propagation speed to the left  $v_L$  and the average within all frames of the spatial frequency with the most contribution  $\bar{w}^*$ . The units of speed are *Ångströms* ( $\text{\AA}$ ) over *femtoseconds* ( $fs$ ) and the units of the average spatial frequency are given in ( $\text{\AA}^{-1}$ ).

Name	$v_R$	$v_L$	$\bar{w}^*$
all-carbon	0.1268	0.1281	0.3331
gp02bn	0.1225	0.1243	0.2962
gp03bn	0.1231	0.1207	0.2888
gp06bn	0.1136	0.1201	0.2900
gp23bn	0.0837	0.0834	0.2788
gp12bn-a	0.1064	0.1050	0.3369
gp12bn-b	0.1209	0.1198	0.3500
gp12bn-c	0.0975	0.1158	0.2767
gp12bn-d	0.1004	0.1004	0.2831
gp12bn-e	0.1255	0.1294	0.3028
all-bn	0.0669	0.0668	0.1850