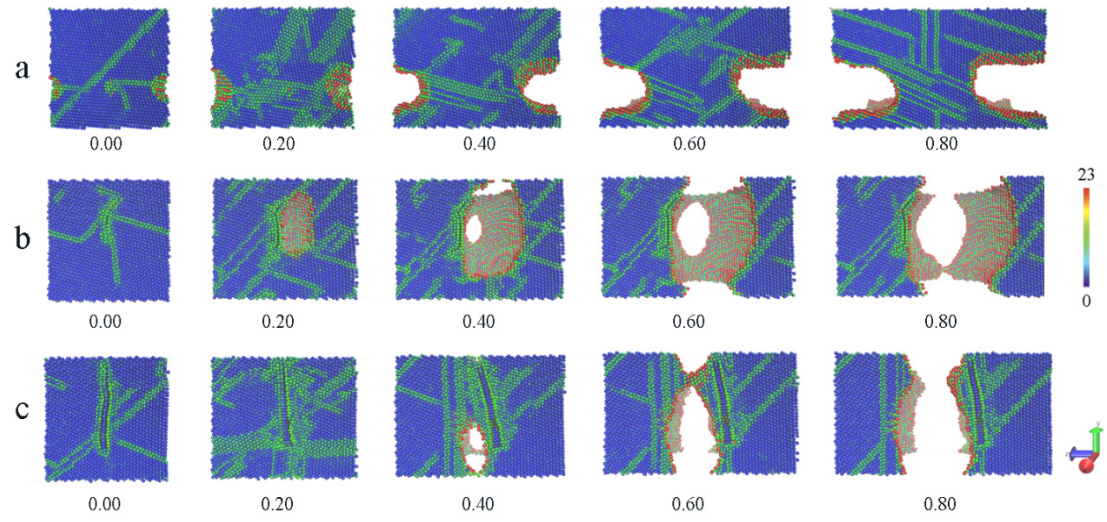


**Figure S1.** The evolutions of atomic structures under different strains when stretched in plane direction. (a) the pure Al structure, (b) the structure of composite with SLG, (c) the structure of composite with BLG.



**Figure S2.** The evolutions of atomic structures under different strains when stretched in normal direction. (a) the pure Al structure, (b) the structure of composite with SLG, (c) the structure of composite with BLG.