Supporting Information for

Two Dimensional Dirac Carbon Allotropes from Graphene

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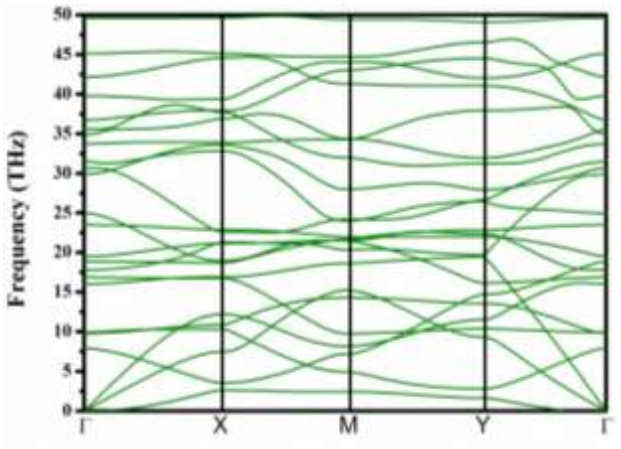

Fig. S1 Phonon band structure of ***S***-graphene

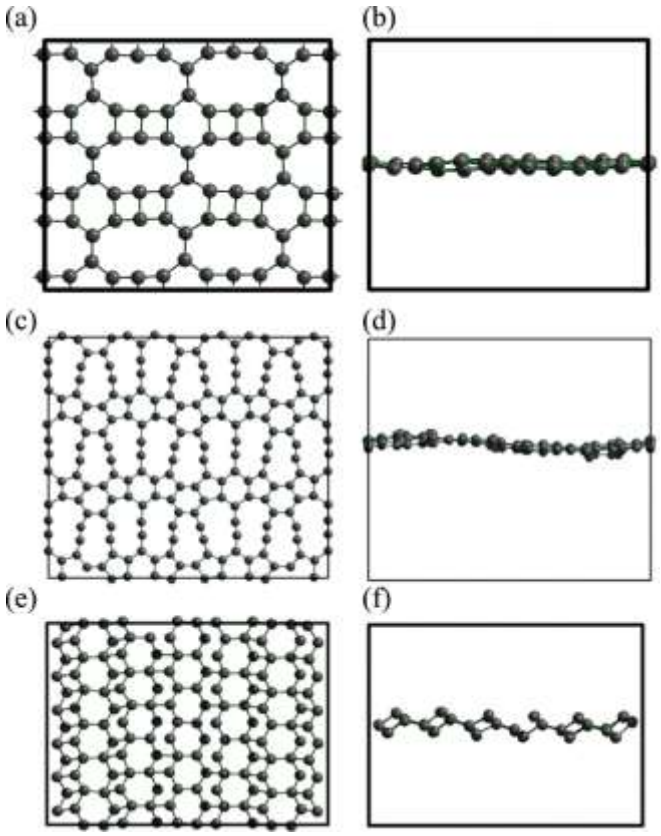

Fig. S2 Snapshots of (a, b)***S***-graphene, (c, d)***D***-graphene and (e, f)***E***-graphene after a 3ps FPMD simulation at 500K

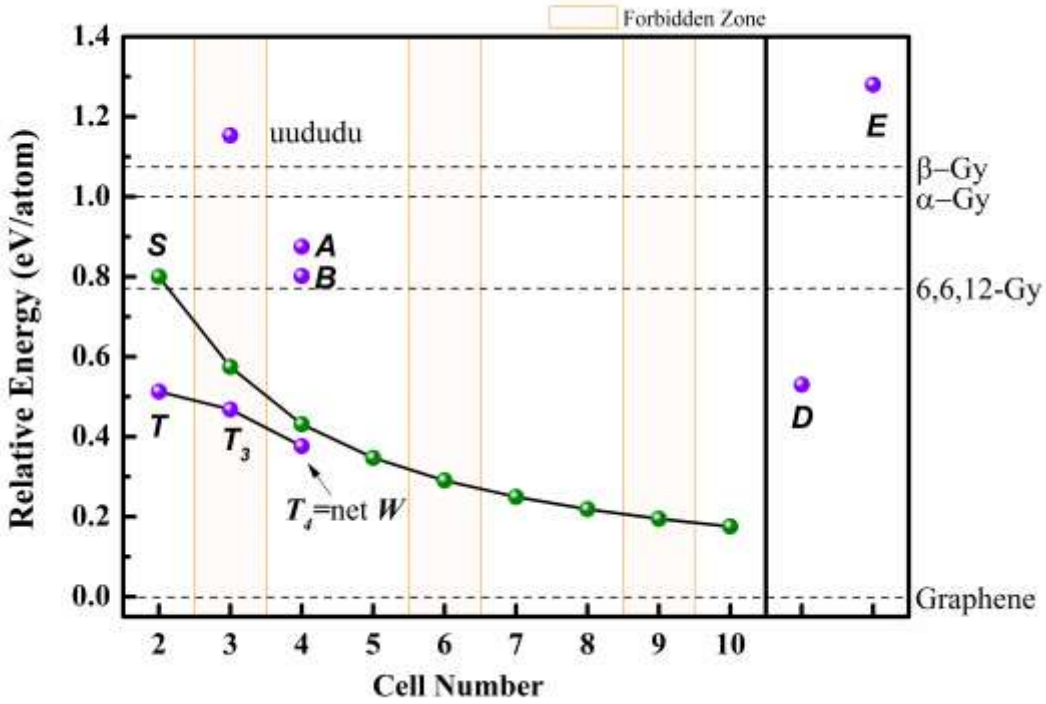

Fig. S3 Relative energies of new structures. The configuration of uududu allotrope is ↑↑↓↑↓↑.

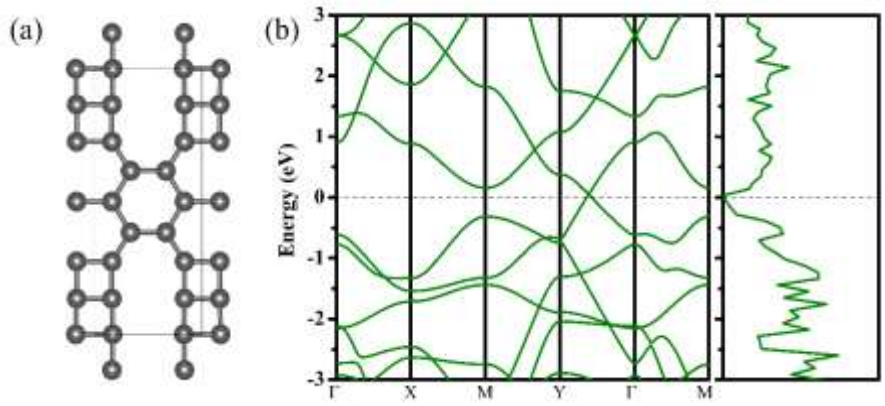

Fig. S4 (a) Crystal structure and (b) electronic structure of ***A***-graphene

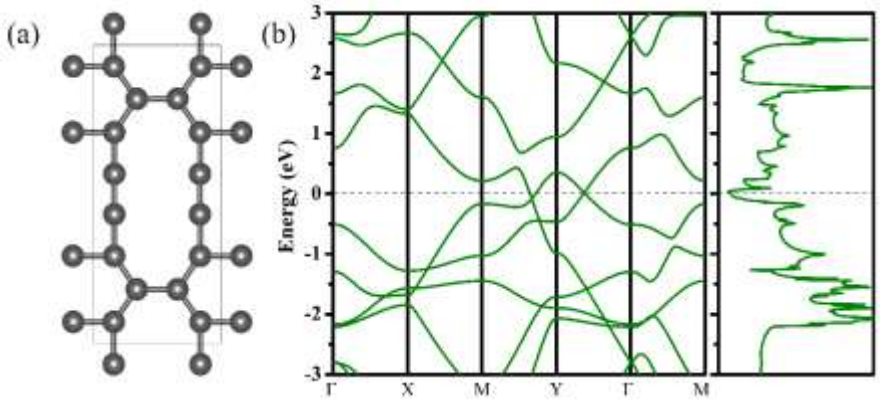

Fig. S5 (a) Crystal structure and (b) electronic structure of ***B***-graphene

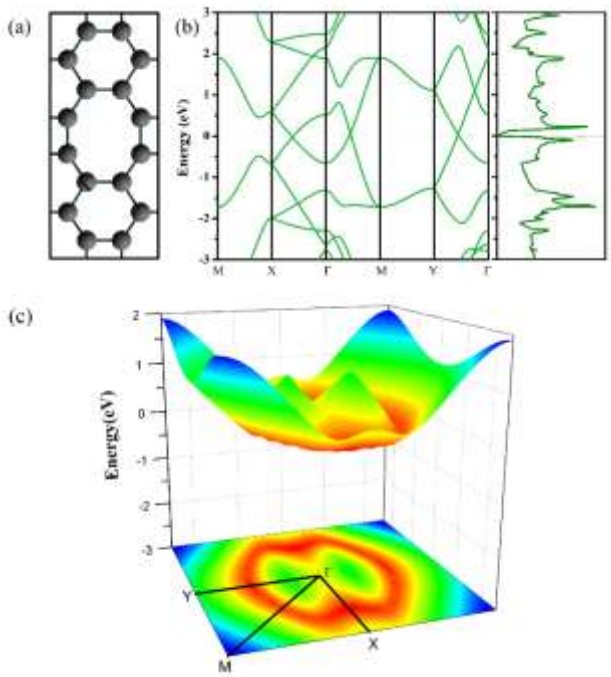

Fig. S6 (a) Crystal structure and (b) electronic structure of T_4-graphene

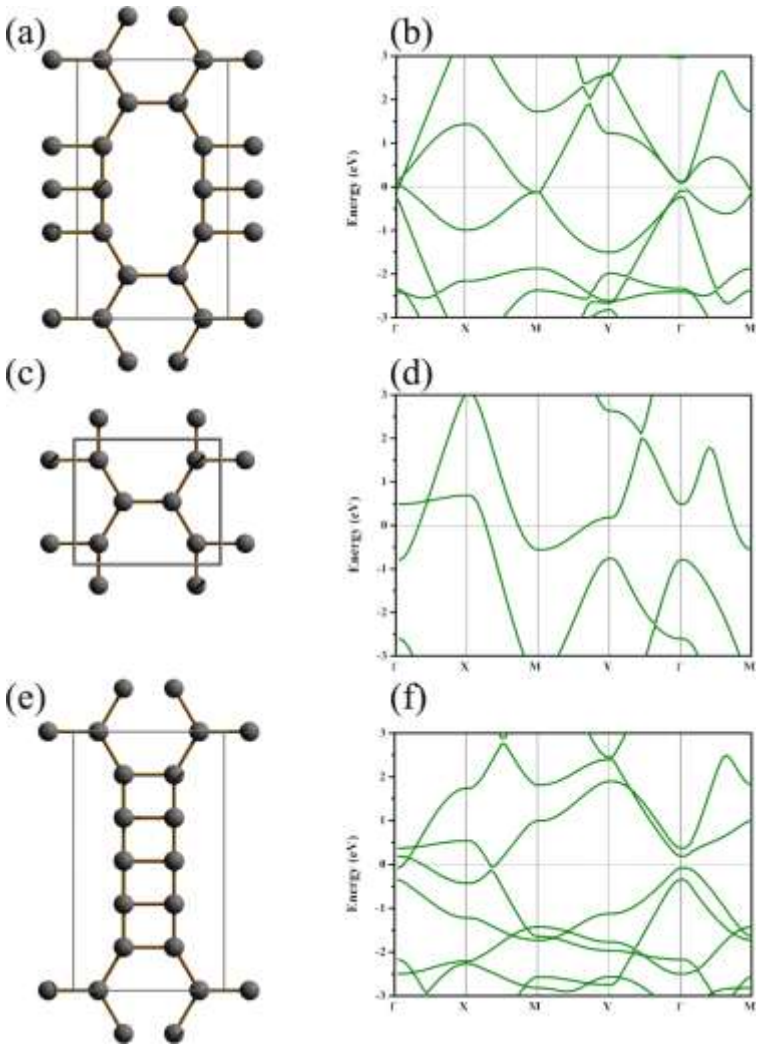

Fig. S7 crystal structures and band structures of metallic (a, b) S_3-graphene**,** (c, d) T_3-graphene and (e, f) graphene allotrope with configuration of ↑↑↓↑↓↑.