Abstract Submitted
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Auger mediated positron sticking on graphene and highly oriented pyrolytic graphite.[1] V A CHIRAYATH, M CHRYSLER, A MCDONALD, Z LIM, K SHASTRY, R GLADEN, A FAIRCHILD, A KOYMEN, A WEISS, Univ of Texas, Arlington — Positron annihilation induced Auger electron spectroscopy (PAES) measurements on 6-8 layers graphene grown on polycrystalline copper and the measurements on a highly oriented pyrolytic graphite (HOPG) sample have indicated the presence of a bound surface state for positrons. Measurements carried out with positrons of kinetic energies lower than the electron work function for graphene or HOPG have shown emission of low energy electrons possible only through the Auger mediated positron sticking (AMPS) process. In this process the positron makes a transition from a positive energy scattering state to a bound surface state. The transition energy is coupled to a valence electron which may then have enough energy to get ejected from the sample surface. The positrons which are bound to surface state are highly localized in a direction perpendicular to surface and delocalized parallel to it which makes this process highly surface sensitive and can thus be used for characterizing graphene or graphite surfaces for open volume defects and surface impurities. The measurements have also shown an extremely large low energy tail for the C KVV Auger transition at 263eV indicative of another physical process for low energy emission.

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