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Evanescent field coupled graphene plasmon waveguide WON JONG YOO, JAEHWAN KWEON, EUYHEON HWANG, Sungkyunkwan Univ — Surface plasmon polaritons (SPPs) is propagating electron-light coupled oscillation. There had been various methods to excite graphene plasmon such as fabricating graphene nano-ribbon and NSOM micro-tip assisted methods. These methods are used for reducing wavelength of incident light and finally matching wave vector to propagate graphene surface plasmon. However, when graphene sheet is located between two different media, evanescent field coupling and excited graphene plasmon properties are still unclear. There are several advantages in using this coupling method. We can control the direction of propagating plasmon and effectively find plasmon modes. Interestingly, propagating wavelength is scaled to 50 – 100 times depending on its modes and light is confined into extremely small mode size. Also its optical properties can be easily controlled by biasing voltage on its surface. To analyze graphene plasmon, we use random phase analysis (RPA) so as to figure out optical permittivity of graphene, and then we use the FDTD (finite difference time domain) and FDFD (finite difference frequency domain) computational methods so as to theoretically figure out the propagation of graphene plasmon waveguide. Also we will report various plasmon properties of graphene plasmon propagation such

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