Demonstration of a variable plasmonic beam splitter

In this contribution, we excite surface plasmon polaritons propagating along a silver nano-wire by a single nitrogen-vacancy center located in a diamond nano-crystal. By using the tip of an atomic force microscope, a second nano-wire is brought into the evanescent field of the first wire such that surface plasmons can evanescently couple. In our experiment, we are able to tune the coupling strength from one nano-wire to another by adjusting the gap with the aid of the atomic force microscope. Numerical calculations of the coupling strength are carried out, which support the values found in the experiment.