Microplasma studies have confirmed the influence of the electrode and dielectric materials on ignition and stability\(^1,2,3\). The chemical, thermal and electrical properties of the dielectric are particularly critical. For the electrodes, metal and semiconductors result in different microplasma characteristics\(^4\).

The aim of our research is to characterise the effects of surface materials on microdischarge behaviour. Diamond or silicon dioxide were used as the dielectric. Electrodes consisted of semiconducting diamond, silicon or metal.

Diamond was obtained by chemical vapour deposition. The electrodes were fabricated by p-type doping of the thin films. This offered us a range of materials properties to characterise the microplasma against. In addition we studied the influence of dimensions (diameters between 25 and 200µm) for both single devices and arrays.

We present optical studies of microplasma in noble gas. In particular we report on gas temperature measurements obtained with emission spectroscopy. Finally we correlate these results, along with electrical characteristics, with the different materials and dimensions mentioned above.

4. S. Mitea et al., Plasma Sources Science and Technology (in press)

* Work supported by the UK Engineering and Physical Sciences Research Council (EPSRC), grant EP/G057176/1