

(Research thematic: Emerging photonics and materials)

Title: Modification of space – charge embedded surfaces by photoactive molecules

Authors: Meriem Bouriga, Vincent Rodriguez, Nathan McClenaghan, Marc Dussauze, Luc Vellutini, Frederic Adamietz, Thierry Buffeteau, Arnaud Tron

Our aim is to modify borosilicate glass surfaces to give them the potential to host photoactive molecules and to study the optical properties of the resulting novel materials. In this goal the glasses were subjected to a thermal polarization technique. The optimization of the poling atmosphere and the electrode type permits the control of the physicochemical properties of the interface by two combined actions: a) chemical activation of the surface to enable the functionalization, and b) introduction of an internal electric field.

In parallel, a grafting protocol has been established to covalently bind, harnessing a click reaction, photoactive molecules to a grafted precursor on the borosilicate surface. The chosen fluorescent molecules are pyrene and BODIPY.

Finally, the electronic properties and the arrangement of the molecular photoactive assemblies in contact with the space charge embedded substrate have been characterized by UV-Visible absorption spectroscopy and second harmonic generation.