o Scientific abstract:

In the first stage, the partner P1 (INOE 2000) has synthesized the following materials:

- Azoderivatives based materials: $[Cu(C_{13}H_{10}N_3O_3)_2]$, $[Cu(C_{13}H_8N_3O_5)_2]$, $[Cu(C_{13}H_{10}N_3O_3)\ (C_{13}H_8N_3O_5)]$
- Ferrocene based materials: $C_{18}H_{13}NO_3$
- Acridine based materials: OHA-NO, HO-OHA-NO, Nac2-OHA-NO, Fu-OHA

Also, there were preliminary synthesis experiments of azoderivative compounds encapsulation in silico phosphate matrices. The organic compound with the structure $C_{17}H_{14}N_4O_3$, M = 322 was selected, because in powder form it has two-photon absorption capability. The soils were prepared using TEOS/EtOH/H3PO4 with a molar ratio 5/155/1. The O3 organic compound was used as an EtOH solution with gravimetric concentrations of 0.5 and 0.25%. The films were deposited by spin coating at 2000 rpm speed at room temperature. The performed characterizations were: FTIR, UVVIS, fluorescence, absorption of two photons.

In the first stage, the coordinator (INFLPR) has performed preliminary MAPLE synthesis to produce thin films of organic materials / organometallic with 2-photon absorption capabilities.

The materials deposited as thin films were:

- Azoderivatives: O3 'and Organometallic complex Er/O3'
- Acridine: OHA
- Standard ferrocene and ferrocene carboxo-aldehyde (FCA)

Further investigations have concerned the surface morphology (AFM, SEM), chemical structure (FTIR) and optical properties (ellipsometry, two photons absorption).

The MAPLE preliminary experiments on the three types of materials (azoderivatives, ferrocene, acridine) lead to adherent films with controllable thickness and chemical structure reproduced in thin film form, after laser transfer. Azoderivatives films are the most efficient in terms of second harmonic emission. Sets of experimental parameters (laser fluences, suitable solvent etc.) were identified to be used in future experiments.

Preliminary studies have been carried out on the use of materials in integrated circuits. Organometal-inorganic matrix samples obtained by sol-gel deposited on ITO / glass and Si (produced by P1) and samples of azoderivatives/ acridine/ ferrocene deposited by MAPLE on

Si substrates coated with a conductive layer of Au (produced by CO) were tested in terms of the conception and manufacturing of optoswitch devices and for applications in optoelectronic integrated circuits (P2 = Sitex).