General information on research lines of possible interest at the Laser group of the University of Vigo

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Since the fabrication of the first lasers around 50 years ago, an large variety of improved laser systems delivering laser radiation with wavelength from deep ultra violet (UV) to far infra red (IR) have been developed. Radiation can nowadays be applied to materials continuously or with short pulses of down to few femtoseconds duration and applications are nowadays focused both to R&D and commercial issues, satisfying a wide range of purposes in military, scientific, medical and uncountable industrial fields. The exigencies of the scientific community to exceed detection limits in the analysis of material properties and to deliver photons with extraordinary accuracy in terms of photon energy, spatial coherence and power, together with the industrial demand of having cheap, high power equipments that are reliable and easily to maintain have boosted the improvement of commercial laser systems.

The mission of the “Laser group” at the University of Vigo with its 3 sub-divsions “Industrial applications of Lasers Group”, “Metrology Group” and “New Materials Group” is focused on the development of production and detection processes based on commercial laser systems. This introduction with very general information on the main research lines of the laser group will anticipate extensive lab visits, where infrastructure, basic concepts and recent achievements of different laser assisted processing techniques, such as Laser induced CVD (LCVD), Pulsed Laser Deposition (PLD), Surface functionalization, Excimer Laser Assisted Annealing (ELA) and Crystallization (ELC), Pulsed Laser Induced Epitaxy (PLIE), Laser cleaning, Laser cladding, Laser spinning, Welding, cutting and drilling, as well as TV holography and interferometry will be shown in detail.

Such material processing must inevitably be accompanied by and receive back-up from exhaustive characterization of surfaces and interfaces as well as by fundamental studies of the interactions between laser radiation and the irradiated materials. An overview of the facilities, available in the groups laboratories as well as at the central facilities of the University of Vigo, will be also given introduce the corresponding lab visits with practical demonstrations of the available techniques.

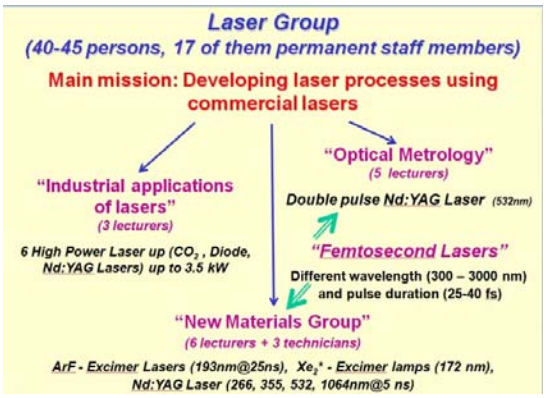

Fig.1 Laser group at UVigo and equipments

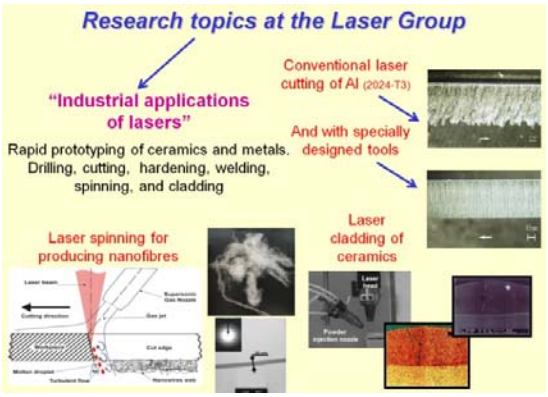

Fig.2 Some research topics of the"Industrial applications of lasers" group

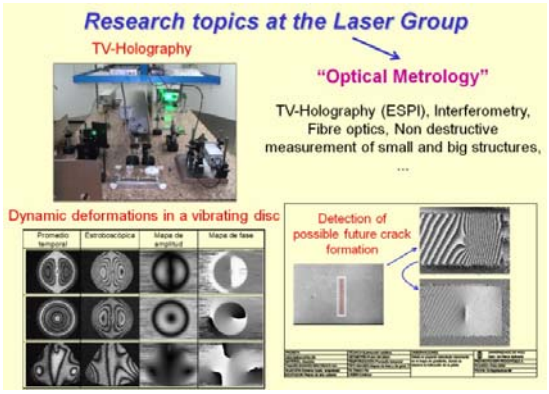

Fig.3 Some research topics of the "Metrology" group

Fig.4 Some research topics of the "New Materials" group