Novel European Sensing Systems for a Greener and Safer World

In the recently launched project *WideLase* a new generation of laser sources for sensing will be developed by a joint effort of European scientists and engineers. A major driver for the realization of these laser sources is the development of a qualitatively new level of techniques for the detection and monitoring of hazardous organic substances.

The availability of improved sensing techniques will result directly in benefits for society and the well-being and health of the population. Within the project technical findings will be instantly validated by two industrial partners of the consortium in important safety applications: A real-time online monitoring instrument for formaldehyde will be investigated by Airoptic (Poland) within the project which also has great commercial potential with emission standards being enforced on products that emit formaldehyde particularly including plywood products. A second application pursued by Airoptic concerns the remote detection of drunk driving. Although alcohol-related traffic accidents have been decreasing throughout the European Union in recent years, driving whilst under the influence of alcohol continues to be an important cause of road fatalities. In addition, a hydrocarbon leak finder will be investigated by Norsk Elektro Optikk (Norway) within *WideLase* preventing fire hazards as well as preventing impacts on world climate and global warming by reducing methane emissions in sectors encompassing oil and gas production or long distance gas transmission.

Those are only examples of the ways in which the newly developed laser sources can bring about benefits to the public. The underlying laser technology will facilitate a diversity of other applications which will have a positive impact on safety and security while simultaneously contributing to a greener world and having an enormous economic potential. *WideLase* will create durable links between European industries and academia and will contribute to maintain European competitiveness at an industrial level, by bringing some of the major European component manufacturing centres ahead of competition in important emerging markets.

Consortium partners nanoplus (Germany) and Mach8 Lasers (the Netherlands) are responsible for mono mode laser development within the project und will investigate two highly innovative concepts for wide tunability and unprecedented performance in the MIR wavelength range between 3.3 µm to 7.0 µm. nanoplus is currently an international leading supplier of lasers for gas sensing applications and notably provided devices for the current NASA Curiosity mission on Mars. Present laser sources, however, made commercially available by consortium partner nanoplus at a variety of wavelengths possess an inherently limited wavelength tuning range. Application-grade, compact, rugged and cost effective widely tunable lasers are not available in the wavelength range of interest. nanoplus therefore sees unique opportunities in the *WideLase* project overcoming these obstacles hindering a widespread exploitation of laser based sensing for many applications where an extended tuning range is required.

The success of the four industrial partners in the various fields will only be possible by a tremendous support from the academic *WideLase* partners at University of Würzburg (Germany) and Wroclaw University of Technology (Poland) laying the project foundation by design, growth and characterization of novel semiconductor structures for mono mode laser fabrication.

Recently, a Grant Agreement was signed between the European Union and the project coordinator *nanoplus Nanosystems and Technologies GmbH*. The *WideLase* project with partners from Germany, Norway, Poland and the Netherlands has a duration of three years and is supported by funding in the amount of Euro 2.2 million from the EU as part of the 7th Framework Programme. Establishing *WideLase* and a European level is essential for obtaining access to the range and quality of personnel, technical expertise and resources required to tackle the various research challenges of the project.

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