DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

A great number of applications require the use of ultraviolet light emitting diodes (LEDs). One can enumerate here UV germicidal irradiation of hospital space and medical equipment as well as water purification using UV radiation or use of UV diodes as a source of light for detection of hidden trademarks. At present, the production of semiconducting UV diodes is feasible due to the development of gallium nitride technology. Research works on this particular technology were appreciated by the Norwegian Nobel Committee that decided to award the 2014 Nobel Prize to three researchers (Isamu Akasaki, Hiroshi Amano and Shuji Nakamura, for the invention of efficient blue light-emitting diodes) who significantly contributed to the production of white light-emitting diodes, commonly used in room lightning. A major breakthrough in the said technology was the development of methodology for p-type doping with magnesium. This was so crucial due to the fact that in the case of the traditional approach it is impossible to obtain a light-emitting diode without p-type conductivity. A similar problem has to be faced for LEDs which are expected to emit light in the range of deeper UV $\lambda<350$nm. P-type doping of AlGaN with magnesium becomes less efficient as the aluminium content gets increased. The aim of the present project is to make use of polarization effects to improve the efficiency of p-type doping of AlGaN layers and understand the p-type conductivity mechanism for such structures. We are convinced that this type of basic research in the field of optoelectronics is indispensable for achieving efficient LEDs emitting light having wavelength $\lambda<350$nm.