



Contribution ID: 116

Type: **not specified**

## Effect of Neutron Irradiation on the Electronic and Optical Properties of AlGaAs/InGaAs-Based Quantum Well Structures

*Thursday, 29 May 2025 15:05 (15 minutes)*

### Abstract

The effect of neutron irradiation on the structural, optical, and electronic properties of doped strained heterostructures with AlGaAs/InGaAs/GaAs and AlGaAs/InGaAs/AlGaAs quantum wells was experimentally studied. Heterostructures with a two-dimensional electron gas of different layer constructions were subjected to neutron irradiation in the reactor channel with the fluence range of  $2 \cdot 10^{14} \text{ cm}^{-2} \div 5 \cdot 10^{17} \text{ cm}^{-2}$ . The low-temperature photoluminescence spectra, electron concentration and mobility, and high-resolution X-ray diffraction curves were measured after the deactivation and during the neutron irradiation. The work discusses the effect of neutron dose on the conductivity and optical spectra of structures based on InGaAs quantum wells depending on the doping level. The limiting dose of neutron irradiation was also estimated for the successful utilization of AlGaAs/InGaAs/GaAs and AlGaAs/InGaAs/AlGaAs and InAs/Al<sub>2</sub>O<sub>3</sub> heterostructures in electronic applications.

**Primary author:** YSKAKOV, Almas (JINR)

**Presenter:** YSKAKOV, Almas (JINR)

**Session Classification:** Parallel Session 4: Nuclear and related analytical techniques in environmental and materials science

**Track Classification:** Parallel session: Parallel session 4