ODSEK za KOMPLEKSNE snovi

Seminar odseka za kompleksne snovi F7

Četrtek, 14.09.2017 ob 13:00 uri, Seminarska soba F7

UV second harmonic generation in structured AlN optical wavequides.

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We investigated the potential of aluminium nitride (AlN) for generation of UV light through a nonlinear optical process of second harmonic generation (SHG). AlN is an excellent candidate since it is transparent to 200 nm and has a large nonlinear susceptibility. High quality thin AlN films were grown on sapphire substrate forming optical waveguies. In order to make SHG efficient, phase matching between the pump and SH waves must be established. The most efficient method is quasi phase matching, where material's crystalographic c-axis is periodically inverted. Another method is modal dispersion phase matching where the appropriate combination of interacting waveguide modes is selected.

We observed several phase matched peaks in UV spectral region in single polar waveguides that could be well explained by the theoretical model for modal dispersion phase matching. The first demonstration of SHG into the visible and near UV spectral region was achieved using structured AlN waveguides with 10 µm periodicity. The theoretical model including higher order quasi phase matching interactions was used for the interpretation of the resulting SH peaks.

Predavanje bo v angleškem jeziku.
Vljudno vabljeni.