

## Motivation

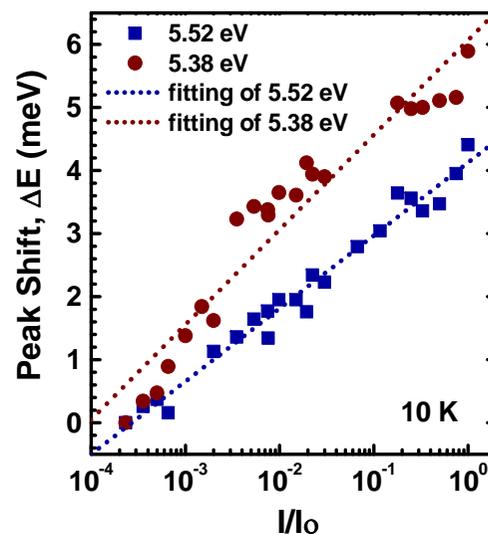
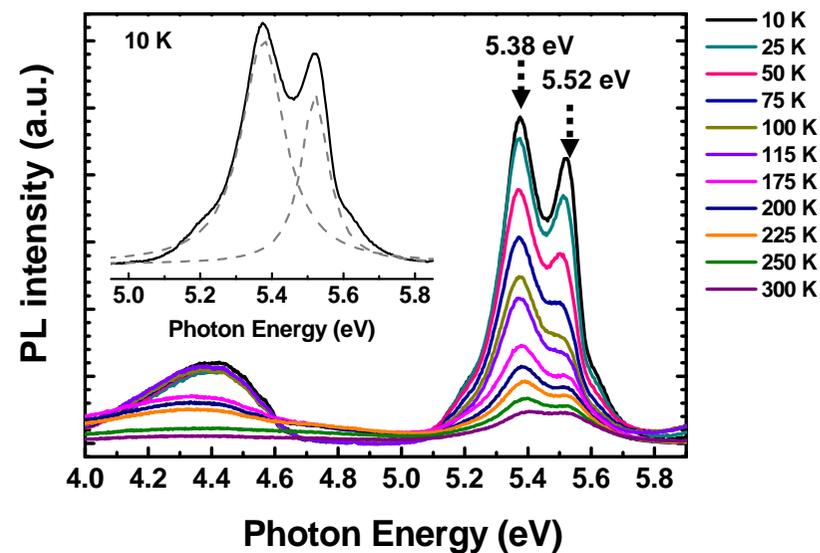
The hexagonal boron nitride (h-BN) is promising material for optical device application in the deep ultraviolet spectral region. Many basic physical properties are still not fully understood. Our main motivations are to understand the transition behaviors of the ultraviolet luminescence.

## Originality

We examined the effect of temperature and excitation density on the luminescence behavior of the near band-edge emission observed from MBE-grown h-BN epitaxial films. These characterizations enable us to understand the transition behaviors of luminescence.

## Impact

By clarifying the fundamental properties, such as an optical band gap, luminescence properties, h-BN semiconductors will become a promising for high-performance deep ultraviolet optical device applications.



The temperature-dependent PL spectra in the range of 10-300 K show the near-band-edge emissions at 5.52 and 5.38 eV.

The variation of the peak energy with excitation density for 5.52 and 5.38 eV emissions reveals that the transition mechanism of both emissions is determined to be donor-acceptor-pair type.

