High density NBI plasma operation using HIGP in Heliotron J

- Short-pulse (10~20ms) & strong gas fueling (HIGP) in NBI plasma ($P_{NB}=1.3$MW) in the low-toroidicity ($\varepsilon_t$) config.
  - A high $n_e$ state in the whole region with its steep gradient in the peripheral region is realized by HIGP.

- A carefully controlled HIGP scenario realized high density (~$10^{20}$m$^{-3}$) NBI plasmas with $T_e0$ and $T_i0 \approx 0.2$-$0.3$ keV.
  - Increase in $W_{DIA}$ ($\langle \beta \rangle_{DIA} \approx 0.8\%$ at 1.3T)
  - Decrease in $I_{Halpha}$ (far from GP)
  - Interesting temporal change in the $n_e$-fluctuations (from BES) in the peripheral region.

- Transition to an improved confinement mode in a high density regime.
  - The characteristic behavior of fluctuations might be closely related to the detailed trigger physics.