SUMMARY

- The Monte Carlo based DEAGS2 code, which is mainly developed for the tokamaks with divertor configuration is successfully implemented for ADITYA tokamak (line averaged electron density, n_e ~ $3x10^{13}$ cm^{-3}, core electron temperature,$T_{e,0}$ ~ 370 eV and edge electron temperature,$T_{e,a}$ ~ 12 eV), which has a circular poloidal ring limiter.

- The penetration of neutral hyrogen inside the plasma is investigated and found that neutral density falls 100 times at $\rho(r/a) \sim 0.4$.

- The H_α spectrum is evaluated using the code and the roles of various physical processes, such as reflection, charge exchange, elastic scattering, dissociation etc., is investigated. It is demonstrated that the molecular dissociation processes mostly cotribute to the H_α spectrum.

- The variation of neutral hydrogen density profile and H_α emissivity profile for various $T_{e,a}$ are also studied and it reveals that they are not much sensitive for the considered Te,a from 7 to 40 eV.