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Enhancement of NUBEAM for the simulation of fast ion and RF-wave interaction based on the quasi-linear theory JAE-MIN KWON, NFRC, Korea, DOUGLAS MCCUNE, C.S. CHANG, PPPL — The Monte-Carlo package NUBEAM for time-dependent modeling of fast ions in a tokamak geometry has been upgraded to simulate the effects of ICRF heating on the fast ions. The RF-wave field data is provided by executing TORIC5 inside TRANSP and passed to NUBEAM. An iterative algorithm has been implemented to match the RF-power absorption value calculated by NUBEAM with the level predicted by TORIC5. The effects of RF-wave fields on the fast ions are modeled by evaluating Monte-Carlo kicks based on the quasi-linear theory. Because of the unique feature of NUBEAM, the so called "goosing" which enables an order of magnitude faster calculation, special care needs to be taken in the Monte-Carlo simulation. The modification of the goose algorithm in the presence of RF-wave fields will be presented. Also, the necessary features of NUBEAM for future application to self-consistent coupling with an ICRF full wave code will be discussed.

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