

Use spectrum simulation code to test D-alpha spectrum of fast ion design work on HL-2A

P. Chen¹, J. Wu¹, L. M. Yao¹, Y.J. Chen¹, H. Wen¹, M. T. Zou¹, W. Zhang¹, J. T. Shen¹, H. Y. Zhou²

¹ *School of Physics, University of Electronic Science and Technology of China, Chengdu, China*

² *Southwestern Institute of Physics, Chengdu, China*

Abstract—In magnetic confined fusion devices, the fast ion is the main source for the self-sustained burning phases, so it is very important to understand the behavior of fast ion. On HL-2A Tokamak device, the fast ions were also generated by neutral beam heating, microwave heating and fusion. This paper was focus on the fast deuterium ion simulation and experimental design work. When the fast ions collide with the neutral beam, some fast ions neutralize, then radiate electromagnetic wave, some of which is in the visible spectrum, but the intensity of this light is usually below the continuum radiation level and is about two orders of magnitude lower than the thermal charge-exchange spectrum (CXS), beam emission spectrum (BES). To investigate the fast ion behavior, this paper dedicated to evaluate the fast ion spectrum on HL-2A, one is using the simulation of spectra (SOS) program to simulate the spectra, and the second is to extract the fast ion spectrum by fitting the experimental data of BES spectrum.