Determination of average kinetic energy of reacting deuterons on the basis of neutron time-of-flight diagnostics[1] KAREL REZAC, DANIEL KLIR, PAVEL KUBES, JOZEF KRAVARIK, FEE CTU in Prague, S 300 TEAM — The kinetic energy of reacting deuterons is one of the important parameter of the fusion plasma where deuterium is presented in a load. The energy of deuterons is determined from the reconstructed neutron energy spectra which are obtained by extended time-of-flight (TOF) method where time-resolved neutron detectors are placed at several distances on two opposite directions from the neutron source. Provided that the deuteron energy is much smaller than the fusion Q-value, it is possible to show that the neutron energy is only a function of the component of the deuteron kinetic energy (and vice versa) in the direction of neutron detection. Consequently, the side- on and end-on energy components of deuterons can be found on the basis of TOF measurement of neutrons in the radial and axial directions. Finally, the average kinetic energy of reacting deuterons can be evaluated on an assumption of radial symmetry of neutron production from Z-pinch plasma.

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