

Abstract Submitted
for the GEC08 Meeting of
The American Physical Society

Analysis of dust particles produced due to interaction between graphite and deuterium helicon plasmas SHINYA IWASHITA, KAZUNORI KOGA, MASAHARU SHIRATANI, Kyushu University — Formation mechanisms of dust particles due to interaction between carbon walls and plasmas in fusion devices have attracted considerable attention, because they pose two potential problems: they can contain a large amount of tritium and their existence in fusion devices may lead to deterioration of plasma confinement. To obtain information on formation mechanisms of dust particles of nm in size in fusion devices, we have generated deuterium helicon discharge plasmas which simulate divertor plasmas in fusion devices and then we have collected and analyzed dust particles produced due to interaction between graphite and the plasmas. Dust particles are made of carbon and can be classified into three kinds: small dust particles below $1\ \mu\text{m}$ in size, large flakes above $1\ \mu\text{m}$ in size, and agglomerates which consist of primary particles of 10 nm. These three kinds suggest three formation mechanisms, that is, CVD growth, carbon films peeled from walls, and agglomeration [1]. There exist a large number of small dust particles below $1\ \mu\text{m}$ in size. All of these features are quite close to those of dust particles collected during the main discharges of LHD. [1] Y. Watanabe, et al. J. Vac. Sci. Technol., A14, 540 (1996).

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Date submitted: 17 Jun 2008

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