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The effects of lithium coating for long pulse and high parameters plasmas in EAST WEI XU, Shenzhen University, JIANSHENG HU, Institute of Plasma Physics, Chinese Academy of Science, RAGESH MAINGI, ZHEN SUN, Princeton University Plasma Physics Laboratory Princeton, GUIZHONG ZUO, YUZHONG QIAN, Institute of Plasma Physics, Chinese Academy of Science, XIANCAI MENG, Shenzhen University, CHENGLONG LI, MING HUANG, Institute of Plasma Physics, Chinese Academy of Science — Impurity and fuel recycling are both two key issues for the achievement of long pulse and high stored energy plasmas in tokamak. The EAST has successfully obtained 101s H-mode discharge with low impurity concentration and low wall recycling under long-term lithium coatings. Before the 101s H-mode pulse was achieved, it was found that impurities, e.g. carbon, molybdenum and tungsten, always increased after 40s during long pulse operation, restricting the pulse length due to increasing edge and core radiation. It was observed over the course of the campaign, however, that C, Mo and W impurities gradually decreased with accumulated lithium. In the 101s H-mode discharge, the tungsten core impurity concentration was maintained below 10-5, with the help of strong lithium evaporative coating and real-time lithium powder injection. Moreover, the plasma density and a low wall recycling were maintained during the entire 101s H-mode. And the recycling level even decreased gradually in the discharge later phase due to the increase of Li-II emission, which inducing by the increase of first wall temperature. Furthermore, the long-term lithium coating is found to reduce the HD ratio to 5%, which improved the efficiency of ICRF minority heating.

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