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Status Report on Anti- α Search at STAR HAO QIU, Institute of Modern Physics, STAR COLLABORATION — In high-energy nuclear collisions, unlike the early universe microseconds after the Big Bang, the relatively short-lived expansion makes it possible for antimatter to decouple quickly from matter. This makes a high-energy accelerator facility the ideal environment for producing and studying heavy species of antimatter. The heaviest antimatter previously observed are $A=3$ antimatter (anti-Helium3, anti-triton and anti-hypertriton). During the RHIC 200 GeV Au-Au beam period in 2010, the STAR detector operated with high luminosities and high data taking rates. This, together with an excellent particle identification based on the Time Projection Chamber and the newly installed Time of Flight detector, puts STAR in a good position to search for anti- α particles (anti-He4). To cope with the large data volume in 2010 and to speed up the search effort, a High Level online tracking Trigger (HLT) was implemented to reconstruct events online and tag rare events with great physics interest. In this talk, we present STAR's HLT capabilities, as well as the status of the anti- α search with the data taken by the HLT in 2010.

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