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Ultraslow muonium for a muon beam of ultrahigh quality

Thursday, 14 October 2010 12:00 (20 minutes)

A new pathway for the achievement of a pulsed slow muon beam by the muonium ionization method is proposed. It uses a thin superfluid helium target in which the stopped muons are pulled towards the liquid vapor interface where they form muonium atoms in the bubble state. As they reach the interface they are emitted and slow down in a vapor layer from which they exit at low velocity and low divergence. Compared to existing schemes, the requirements on the power of the Lyman alpha 1s-2s excitation laser are significantly reduced and an outgoing muon beam of many orders of magnitude better phase space quality is achieved.

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