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Recent Progress on Ion-Driven Fast Ignition[1] JUAN C. FERNANDEZ, B.J. ALBRIGHT, K.A. FLIPPO, D.C. GAUTIER, B.M. HEGELICH, M.J. SCHMITT, R.C. SHAH, L. YIN, Los Alamos National Laboratory, J.J. HONRUBIA, M. TEMPORAL, Univ. Politecnica Madrid — We report on the encouraging progress from research on fusion fast ignition (FI) initiated by laser-driven ion beams. Compared to electrons, FI based on a beam of quasi-monoenergetic ions (protons or heavier ions) has the advantage of a more localized energy deposition, which minimizes the required total beam energy. High-current, laser-driven ion beams are very promising for this purpose, and because of their ultra-low transverse emittance, these beams can be focused to the required dimension, $\sim$ tens of microns. Because they are created in ps timescales, these beams can deliver the power required to ignite the compressed D-T fuel, $\sim$ 10 kJ / 50 ps. Our recent integrated calculations of ion-based FI include high fusion gain targets and a proof of principle experiment, which indicate the progress is feasible. The scientific issues and progress in the generation of the required laser-driven ion beams are summarized.

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