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Direct *ab initio* iron melting at high pressure

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Iron is the main constituent of the Earth's core. Considerable efforts have been made to clarify the properties of iron at high pressure and temperature. These efforts have not only clarified the iron phase diagram, but also produced a number of discrepancies, the most noticeable of them being the difference between the so called "low" and "high" melting curves. We will report the results of *ab initio* molecular dynamics direct simulations of iron melting at high pressure applying projector-augmented wave implementations of density functional theory. The results provide support to the high melting curve.