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Exploring Unconventional Superconductivity in 2M-WS2 thin layers

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Description: Superconductivity, characterized by zero electrical resistance, has been a central theme of condensed matter physics since its discovery. While conventional superconductivity can be understood through the BCS theory with electron-phonon coupling, deviations from this introduce the enigmatic field of unconventional superconductivity, offering potential breakthroughs in quantum technologies. Among transition metal dichalcogenides, 2M-WS2 is particularly notable, achieving the highest transition temperature (8.9 K) in this class. Both experimental results and theoretical predictions affirm the topological superconducting properties of bulk 2M-WS2. In this work, we explore deeply into the unconventional superconducting of thin 2M-WS2 flakes, emphasizing the important role of magnetic fields. Remarkably, when the flake thickness decreases below a certain threshold, the extracted in-plane upper critical field at zero …