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Oral

During the period of Oct 21, 2025 through Nov 20, 2025, PUNCH observed a series of coronal mass ejections that appeared to steepen into shocks within the field-of-view of the Wide Field Imagers (WFI). Some of these shocks were later detected by the in-situ magnetic field and plasma instruments on board Solar Orbiter (SoLO) located at distances from 0.67 au to 0.72 au. Particle instruments on board SoLO also detected significant increases in the intensities of energetic ions – the so-called solar energetic particles – extending in energy up to several MeV/nuc well before these shocks were observed by SoLO. Furthermore, some shocks remained sufficiently strong and continued to accelerate energetic particles up to several MeV/nuc at SoLO's location. In this paper, we present a synthesis of these synergistic observations that clearly demonstrate the potential of PUNCH to provide a new way to understand and track the evolution of CME shocks as they propagate through the inner heliosphere, and more importantly, to detect SEP-producing CME shocks well before they are observed in-situ.

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