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The Extreme-ultraviolet late phase of a solar flare triggered by injection of nonthermal electrons to the footpoints of coronal loops

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Extreme-ultraviolet late phase (ELP) refers to the second extreme-ultraviolet (EUV) radiation enhancement in some solar flares, minutes or hours after the X-ray emission peak at the flare impulsive phase. ELP loops often have distinct configurations from the main flaring loops and the enhanced EUV emission may imply an additional heating process. Here we analyzed a C1.4 flare which has a typical EUV late phase. The ELP appeared right after a ~6 minute-long enhancement of microwave emission in the radio dynamic spectrum. Microwave imaging reveals a radio-emitting nonthermal loop structure that connects the flaring region to a remote footpoint of the ELP loop. Our analysis suggests that nonthermal electrons propagated from the energy release site in the corona to this loop footpoint, leading to evaporation of the heated plasma to fill the ELP loop.

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