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Cooper Pair Wavefunction Approach to the AC Josephson Effect YONG-JIHN KIM, University of Puerto Rico - Mayaguez — Recently, we have proposed Cooper pair wavefunction approach to the DC Josephson effect, which shows the threshold resistance of SIS Josephson junctions (in the high tunneling resistance regime). In the MgB₂case, since the threshold resistance is so small for the big gap, MgB₂break junctions and SIS tunnel junctions display the Josephson supercurrent only for the small gap. We apply this approach to the AC Josephson effect. The amplitude of the oscillating supercurrent in the presence of the electric field is calculated, using the Cooper pair wavefunctions formed by the Airy functions. We also discuss the sign problem of the pair-quasi-particle interference term.

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