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Shock propagation in prompt supernova explosion and the MSW effect of neutrino SHIOU KAWAGOE, TOSHITAKA KAJINO, The Graduate University for Advanced Studies and National Astronomical Observatory of Japan, KAZUHISA YOSHIHARA, HIDEYUKI SUZUKI, Faculty of Science and Technology, Tokyo University of Science, KOHSUKE SUMIYOSHI, Numazu College of Technology, SHOICHI YAMADA, Faculty of Science and Engineering, Waseda University — The MSW effect of supernova neutrino is the focus of recent neutrino astrophysics. It is still an open question how the shock wave propagation affects the neutrino oscillation. Using an implicit Lagrangian code for general relativistic spherical hydrodynamics, we succeeded in numerical simulations of breakout of shock wave propagation through the stellar envelope. We first discuss our successful result of shock wave propagation which is generated by adiabatic collapse of iron core and compare with non-adiabatic collapse. Secondly, we apply this model to the neutrino oscillation and calculate survival probabilities of three light-neutrino families. We discuss how the flux and energy spectrum of each neutrino species can change due to the MSW effect.

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