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Universal Dynamic Exponent at the Liquid-Gas Transition from Molecular Dynamics SUBHRANIL DE, AN CHEN, ELDRED CHIMOWITZ, YONATHAN SHAPIR — The liquid-gas system is expected to exhibit distinct dynamic behavior in the fluid's critical region (Model H). In this work we present molecular dynamics simulations of a Lennard-Jones fluid model starting from specially designed, near-equilibrium, initial conditions. By following the fluid's relaxation towards equilibrium, we calculate the requisite transport coefficients in the fluid's critical region. The results yield the scaling behavior of the thermal diffusion coefficient $D_T \sim \xi^{-1.023\pm0.018}$ (ξ is the correlation length) and a non-conventional divergent heat conductivity, all of which are in accord with mode-coupling and renormalization group predictions, as well as some experimental data.

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