# From CALPHAD database to Virtual steelmaking plant: Application of ChemApp for process simulation tools

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As one of key developer groups of the FactSage database, our research team has expanded the CALPHAD type thermodynamic database for steelmaking applications over the past 15 years. We have also introduced the so-called Effective Equilibrium Reaction Zone (EERZ) model which links the CALPHAD thermodynamic database with process kinetics for process simulations. Using the EERZ concept, we have successfully developed a series of process simulation models of EAF, Hot metal pretreatment, BOF, LF, VTD, RH, Tundish and Continuous casting which can accurately simulate the real time steel plant operations. The ChemApp is used for the development of standalone programs of these process simulations. In this talk, the recent development of the process simulation models and our research direction for the next generation digital twin will be highlighted.