Bridging the gap between core-collapse supernova simulations and observations

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With recent advances in numerical techniques and computing power theoretical modeling of a core-collapse supernova, a cataclysmic event ending the life of a massive star, in three dimensions have become feasible. The violent explosion, which occurs at the very core of a massive star within a second timescale, is observed in electromagnetic wavelengths only after the supernova shock wave launched by the explosion has broken out at the surface of the exploding star. Thus in order to exploit the vast amount of observational data and use them for testing theoretical models, simulations connecting the moment of the explosion to an epoch after the shock breakout must be carried out. In this talk, I will review recent progress which have been made in bridging this gap between simulations and observations.