Weak-strong uniqueness in energy-reaction-diffusion systems

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We establish weak-strong uniqueness and stability properties of renormalised solutions to a class of energy-reaction-diffusion systems, which genuinely feature cross-diffusion effects. The systems considered are motivated by thermodynamically consistent models, and their formal entropy structure allows us to use as a key tool a suitably adjusted relative entropy method. Weak-strong uniqueness is obtained for general entropy-dissipating reactions without growth restrictions, and certain models with a non-integrable diffusive flux. The results also apply to a class of (isoenergetic) reaction-cross-diffusion systems.