FAST REACTION LIMIT OF COMPETITON DIFFUSION SYSTEMS

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Abstract. The purpose of this chapter is to investigate the singular limit of reaction-diffusion systems, or more precisely the fast reaction limit of competition diffusion systems. It often turns out that such systems converge to free boundary problems, which may have the form of Stefan problems. On the other hand, some reaction diffusion systems can converge to cross-diffusion systems. As an application of the fast reaction limit, we also discuss the relationship between Turing's instability and cross-diffusion induced instability.