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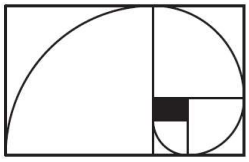

ENSAIOS MATEMÁTICOS
2023, Volume **38**, 263–313
https://www.doi.org/10.21711/217504322023/em3810

Couplings and attractiveness for general exclusion processes

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Abstract. Attractiveness is a fundamental tool to study interacting particle systems and the basic coupling construction is a usual route to prove this property, as for instance in the simple exclusion process. We consider here general exclusion processes where jump rates from an occupied site to an empty one depend not only on the location of the jump but also possibly on the whole configuration. These processes include in particular exclusion processes with speed change introduced by F. Spitzer in [18]. For such processes we derive necessary and sufficient conditions for attractiveness, through the construction of a coupled process under which, in any coupled transition, discrepancies on the involved sites do not increase, or even decrease. We emphasize the fact that basic coupling is never attractive for this class of processes, except in the case of simple exclusion, and that the coupled processes presented here necessarily differ from it. We study various examples, for which we determine the set of extremal translation invariant and invariant probability measures.

Keywords. Particle systems, attractiveness, couplings, discrepancies, invariant measures, exclusion processes with speed change.

2000 Mathematics Subject Classification: 60K35, 82C22.
Submitted on January 20, 2023, final version accepted on June 26, 2023.