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**Deriving bisimulation congruences for reactive systems.** (English) [Zbl 0999.68141](#)

Palamidessi, Catuscia (ed.), CONCUR 2000 - Concurrency theory. 11th international conference, University Park, PA, USA, August 22-25, 2000. Proceedings. Berlin: Springer. Lect. Notes Comput. Sci. 1877, 243-258 (2000).

Summary: The dynamics of reactive systems, e.g. CCS, has often been defined using a labelled transition system (LTS). More recently it has become natural in defining dynamics to use reaction rules – i.e. unlabelled transition rules – together with a structural congruence. But LTSs lead more naturally to behavioural equivalences. So one would like to derive from reaction rules a suitable LTS. This paper shows how to derive an LTS for a wide range of reactive systems. A label for an agent  $a$  is defined to be any context  $F$  which intuitively is just large enough so that the agent  $Fa$  (“ $a$  in context  $F$ ”) is able to perform a reaction. The key contribution of this paper is a precise definition of “just large enough”, in terms of the categorical notion of relative pushout (RPO), which ensures that bisimilarity is a congruence when sufficient RPOs exist. Two examples – a simplified form of action calculi and term-rewriting – are given, for which it is shown that sufficient RPOs indeed exist. The thrust of this paper is, therefore, towards a general method for achieving useful behavioural congruence relations.

For the entire collection see [\[Zbl 0944.00069\]](#).

**MSC:**

[68Q85](#) Models and methods for concurrent and distributed computing (process algebras, bisimulation, transition nets, etc.)

Cited in **1** Review  
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