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BOOK REVIEW

TORGNY LINDVALL, *Lectures on the Coupling Method*. Wiley, New York, 1992.

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This really is a delightful book. For me, not being an expert, it was as though the author had set out to "charm me with his subject," and like a good teacher, he succeeded. The exposition is lively, unassuming, highly motivating, and conscientious, similar in spirit to the books of Williams [5, 6]. The subject is taught by example. In the words of the author:

> To know a method is to have learned how it works. What we have ahead of us is essentially a collection of applications of a few basic ideas consisting largely of topics of wide common interest with an attempt to maximize diversity.

It is intended to serve graduate courses and seminars in departments of mathematics, statistics and operations research. Basic familiarity with measure-theoretic probability is assumed.

Written primarily as a textbook, it is also the first definitive reference on the coupling method and its many uses. From a practical point of view it is well signposted and, well, "mixing" in the sense that it can be opened and understood to at least some extent at any point in the text. For a subject with such far-reaching applications, the author has done well to include so many. It seems to me that what is not included is at least hinted at and the reader is well informed on where to look for more details.

We will now present a brief introduction to the coupling method, just to pique your interest. This will be followed by an outline of the text.

The coupling method. The coupling method provides an ingenious way of comparing probability measures. The idea is to construct, if possible, random elements on a common probability space in such a way that the comparison may be carried out in terms of the random elements. Roughly speaking, applications fall into three categories:

1. Establishing ergodicity and obtaining rates of convergence to stationarity for Markov processes.
2. Justifying weak approximations.
3. Establishing inequalities.

The first two are achieved via estimates of total variation distances, based on the *coupling inequality*. (The coupling inequality for Markov chains is described below: we refer the reader to the text for a general version.)

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