MR2768875 (2012h:03003) 03-02 (03C90 03D15 03F20 03F30 60A05 68Q15)
Krajíček, Jan (CZ-KARL)
★**Forcing with random variables and proof complexity.**
London Mathematical Society Lecture Note Series, 382.
Cambridge University Press, Cambridge, 2011. *xvi*+247 *pp*. $65.00. *ISBN* 978-0-521-15433-8

A fundamental problem related to the NP versus co-NP question is to provide super-polynomial lower bounds on a given proposition proof system. This is equivalent to constructing certain extensions of models of bounded arithmetic. Jan Krajíček is the leading expert on these problems and in this book he provides a new approach to building models of bounded arithmetic which combines methods and techniques from model theory, forcing and computational complexity. This novel approach includes building models from random variables defined on a sample space, which is a non-standard finite set sampled by functions of some computational complexity.

   Personally, I find Krajíček's approach a highly stimulating collage of ideas. I recommend the book strongly to anyone interested in logical approaches to fundamental problems in complexity theory.

Reviewed by *Søren M. Riis*

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