Preface

The velocity-dependent one-scale (VOS) model was born in the first year of my Ph.D., in early 1995, building upon a previous model by Tom Kibble. In the intervening years it became the canonical model for quantitative studies of the evolution of defect networks, and underwent various important extensions. The purpose of this book is to present a brief overview of the current state of the model.

A literature search will easily reveal several hundred papers (only a fraction of which are my own) discussing many aspects of the VOS model, or directly using it for various purposes. Reviewing, or even citing, all this literature would require a much larger volume and I will not attempt to do so here. Instead, my goal is to provide a unique entry point into the field, by discussing the basic results of the model which the interested reader—perhaps a Masters or Ph.D. student—can learn in a few weeks and use as a starting point for his or her further endeavors.

I thank my Ph.D. supervisor, Paul Shellard, for introducing me to a topic that I still find exciting and challenging. I also thank the rest of my collaborators and my students, for countless interesting discussions on the topic. A large fraction of the numerical work necessary to calibrate this model would not have been possible without the various generations of the COSMOS Shared Memory system at DAMTP, University of Cambridge. At the time of writing, this equipment is operated on behalf of the STFC DiRAC HPC Facility and funded by BIS National E-infrastructure capital grant ST/J005673/1 and STFC grants ST/H008586/1, ST/K00333X/1.

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