

UNIVERSITY OF CALIFORNIA, SAN DIEGO

Coseismic and Postseismic Deformations Associated With the 1992 Landers,
California, Earthquake Measured by Synthetic Aperture Radar Interferometry

A dissertation submitted in partial satisfaction of the requirements
for the degree of Doctor Of Philosophy in Earth Sciences

by

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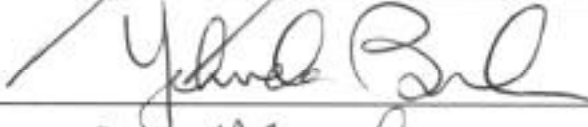
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Chair

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This dissertation is dedicated to my parents:

Dr. Albert M. Price and Virginia L. Price

"Not everything that I do with my roast chicken is necessarily scientific. Many aspects of my method are based on my feeling and experience. For instance, I *always* give my bird a generous butter massage before I put it in the oven. Why? Because I think the chicken likes it- and, more important, *I* like to give it."

Julia Child

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PUBLICATIONS

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ABSTRACT OF THE DISSERTATION

Coseismic and Postseismic Deformations Associated With the 1992 Landers,
California, Earthquake Measured by Synthetic Aperture Radar Interferometry

by

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Doctor of Philosophy in Earth Sciences

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This dissertation focuses on using a relatively new technology called Synthetic Aperture Radar Interferometry (InSAR) to measure the displacements of the Earth's surface during the coseismic and postseismic deformation phases of the 1992 Landers, California, earthquake. An introduction to InSAR and its application to movements of the Earth's surface are given in Chapter 1. In Chapter 2, microwave

remote sensing and the range-Doppler Synthetic Aperture Radar (SAR) processing algorithm are discussed. In Chapter 3, the "phase gradient" method is used to map fractures and triggered slip on faults induced by the Landers earthquake. In Chapter 4, we investigate the vertical component of displacement on the Landers earthquake rupture and generate a coseismic vertical displacement map using a combination of InSAR displacement maps and elastic half-space modeling. In Chapter 5, we map displacements of the Earth's surface during the postseismic phase of deformation using InSAR measurements and predict these displacements assuming that the deformation mechanism is after-slip in an elastic half-space. Chapter 6 lists the main conclusions of Chapters 3,4, and 5.