OBSERVATIONS AFTER THE Mw 7.1 2017 PUEBLA EARTHQUAKE

PEER-CEER Post-Earthquake Field Investigation Program

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INTRODUCTION

On September 19, 2017 a Mw 7.1 earthquake was recorded at an epicentral distance of 120 km from Mexico City (National Seismological Service, 2017). The hypocenter of this event was located right at the edge where the Cocos plate dip-angle increases in its subduction process beneath the North American plate (GEER Report), with coordinates 18.40N, 98.72W and depth of 57 km (National Seismological Service, 2017).

A week after the seismic event, a four day post-earthquake reconnaissance mission was organized, between the Pacific Earthquake Engineering Center (PEER) and the Colombian Earthquake Engineering Research Network (CEER). Once on the ground the team joined forces with local researcher and faculty from UNAM. This joint effort brought together over 20 engineers, who conducted a rapid post-earthquake assessment of over 60 buildings in Mexico City. The team recorded the seismic performance of these structures, assessing the structural and the non-structural components response.

Strong motion acceleration records were provided to the PEER-CEER reconnaissance group by the National Seismological Service at UNAM. Elastic an inelastic response history analyses of single degree of freedom systems helped understand why damage concentrated on structural systems with certain heights.

STATISTICS OF STRUCTURAL OBSERVATIONS

A total of 62 buildings were visited.
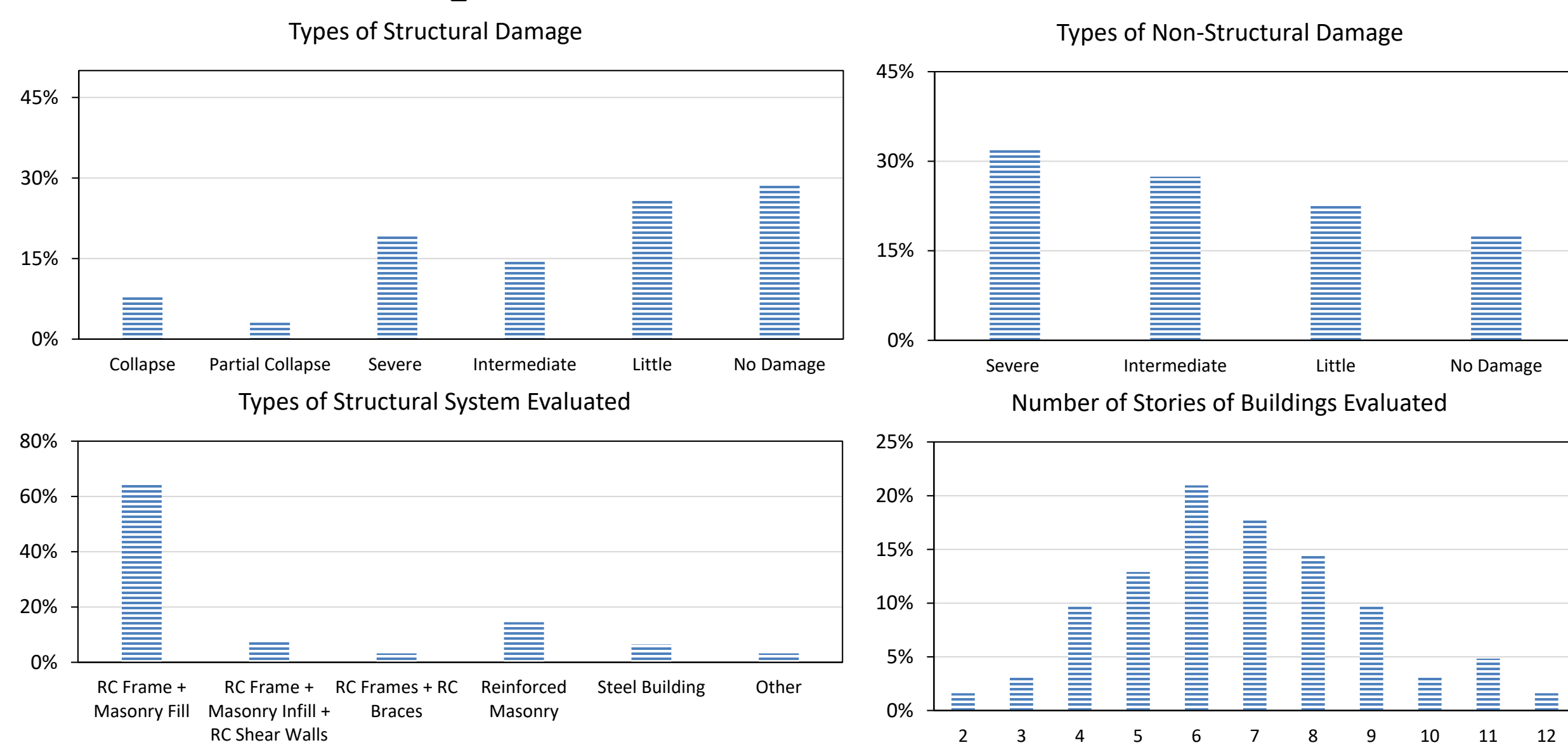
COMMENTS

This joint reconnaissance effort proved successful by putting together young international researchers with local anchoring professors. This multinational team was able to respond within a week of the occurrence of the earthquake to help the community of local engineers assess and report the damage state in multistory buildings.

The spectral analyses performed helped understand why damage concentrated on lower rise buildings (i.e. with less than 10 stories).

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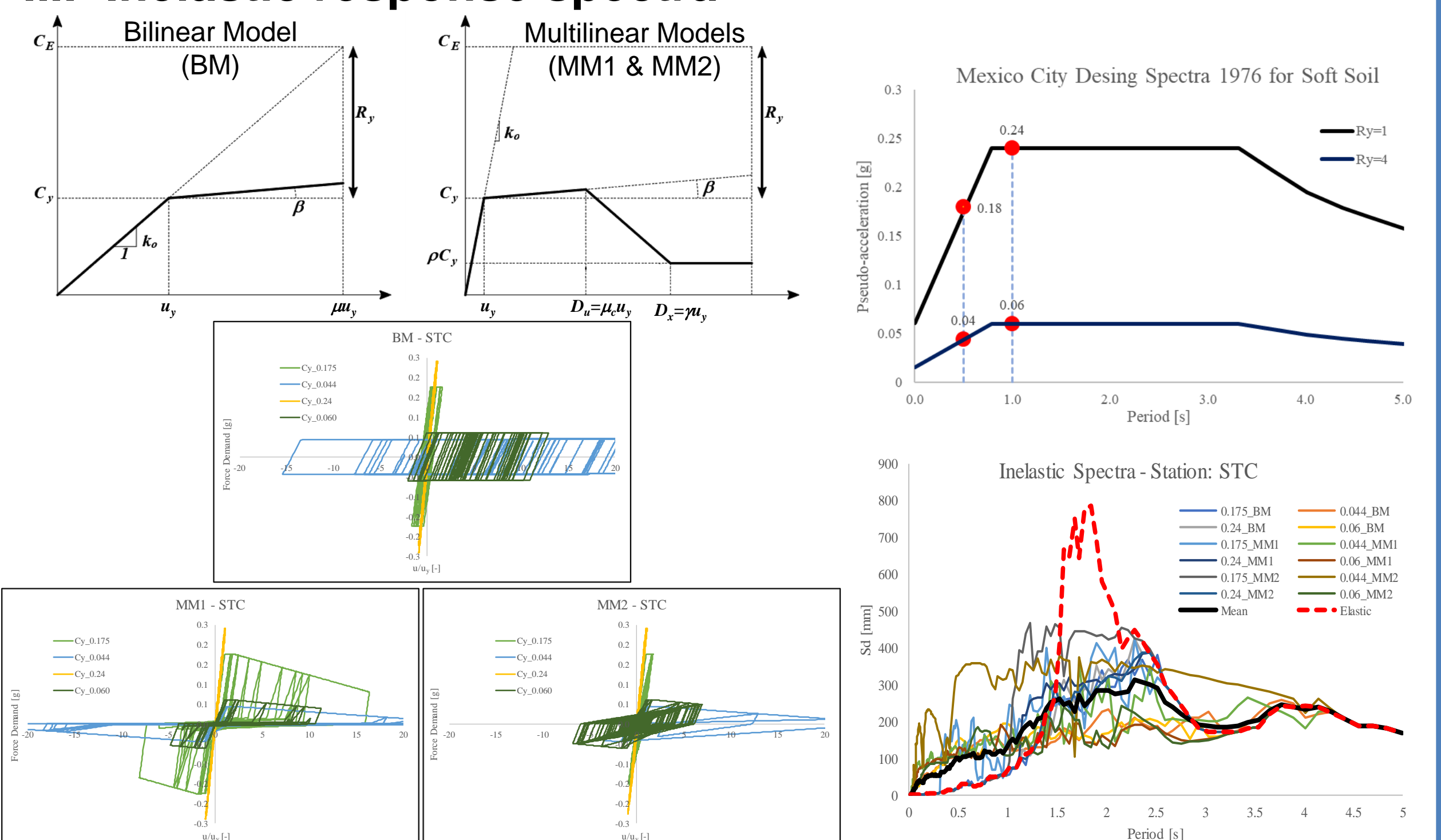
RESULTS

I. Station location on Mexico City microzonation map and elastic response spectra
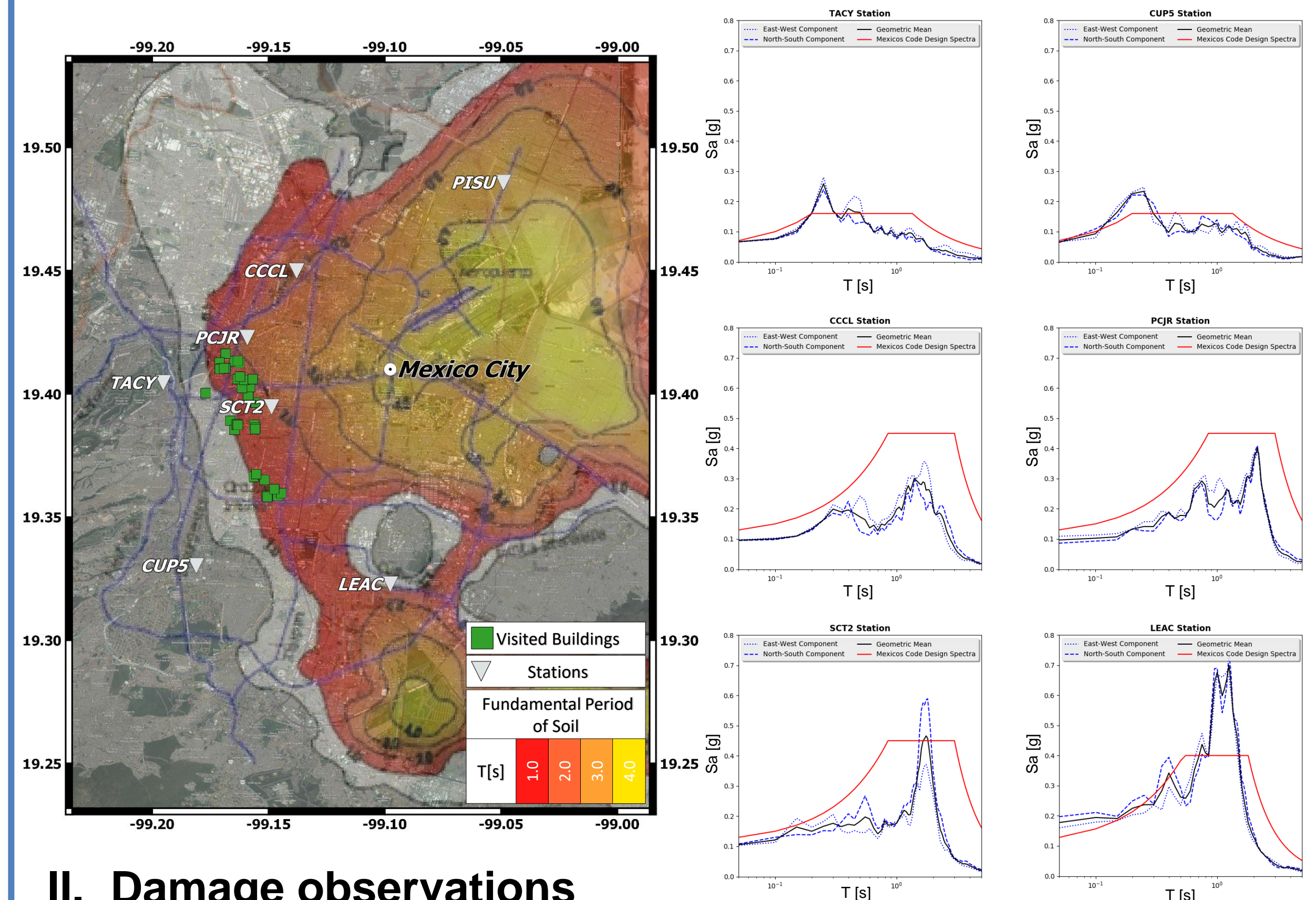
II. Damage observations

III. Inelastic response spectra