POST Analysis and Modeling

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POST Data Analysis

- What can PVM LWC data tell us about the structure of the EIL?

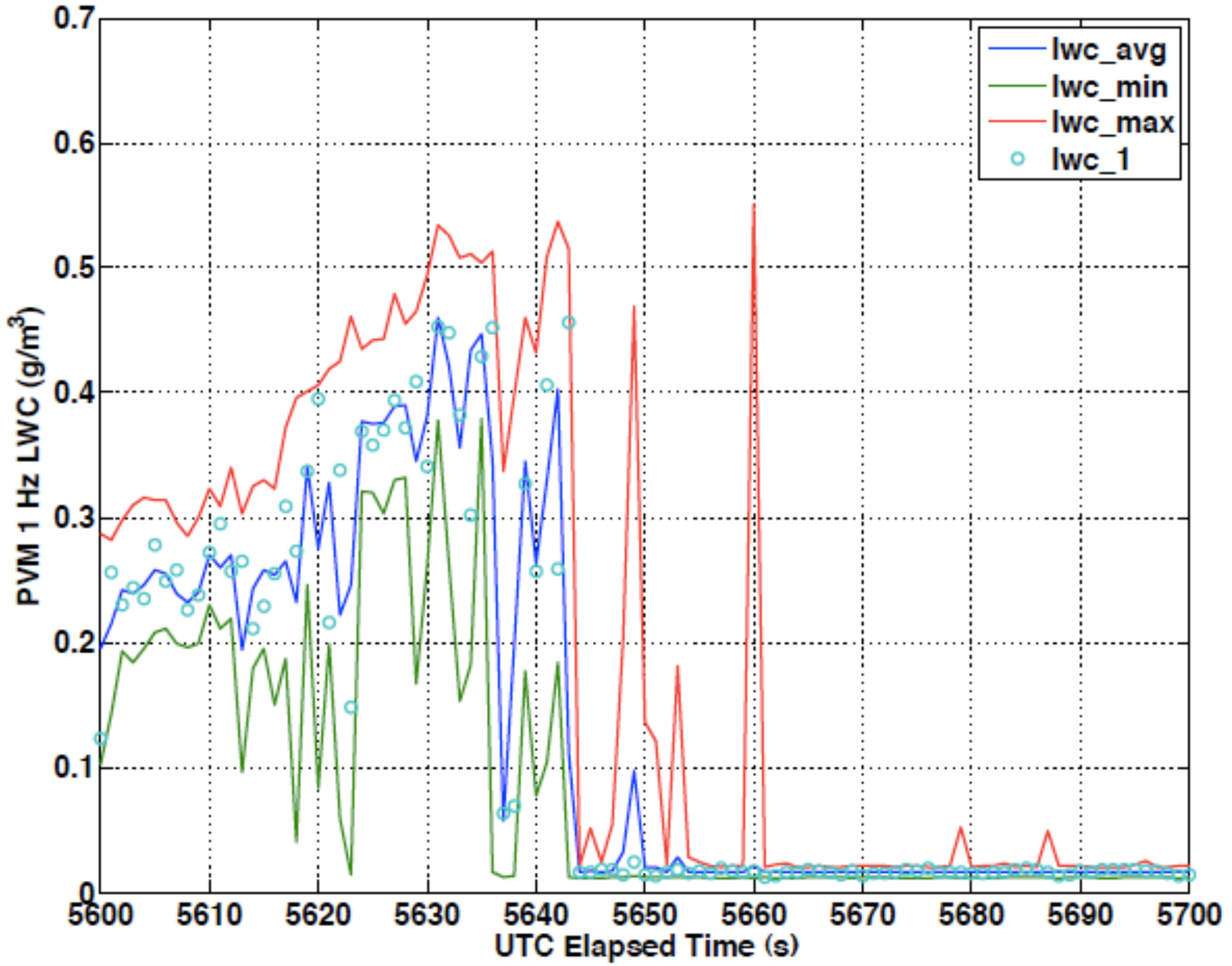

Figure 1: Average, maximum, and minimum LWC from 1-kHz PVM data within each 50-m segment during a 100-s (5-km) long flight segment during RF03 as the aircraft penetrated the EIL from below. The LWC has not been adjusted to remove its zero offset.

POST Data Analysis

- What can PVM LWC data tell us about how SGS variability depends on grid size?

Cloud fraction histograms in all partly cloudy 50-m segments for grid sizes of 50 m, 5 m, and 0.5 m

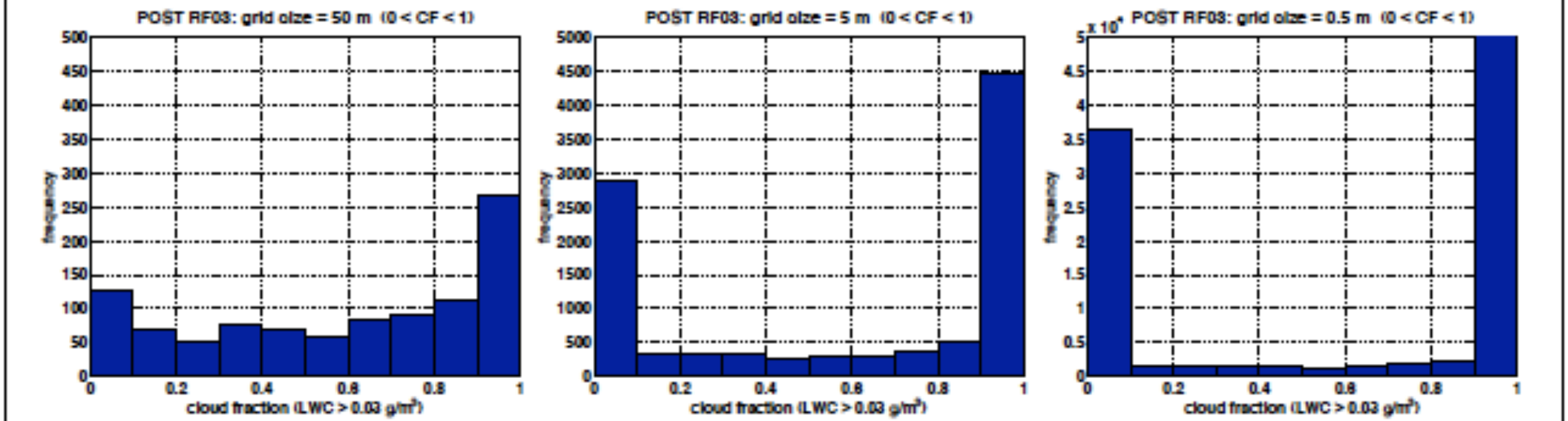

Figure 2: Cloud fraction histograms in all partly cloudy 50-m segments for grid sizes of 50 m, 5 m, and 0.5 m.

POST Data Analysis

- What is the characteristic filament size in mixing regions of the EIL, as detected by the PVM and UFT?
- Can LES resolve the filaments?

POST Modeling: LEM

- Can we use the linear eddy model (LEM) to predict and understand the filament size distribution observed in POST flights?
- Can the LEM tell us what a SGS mixing model for LES should actually do?

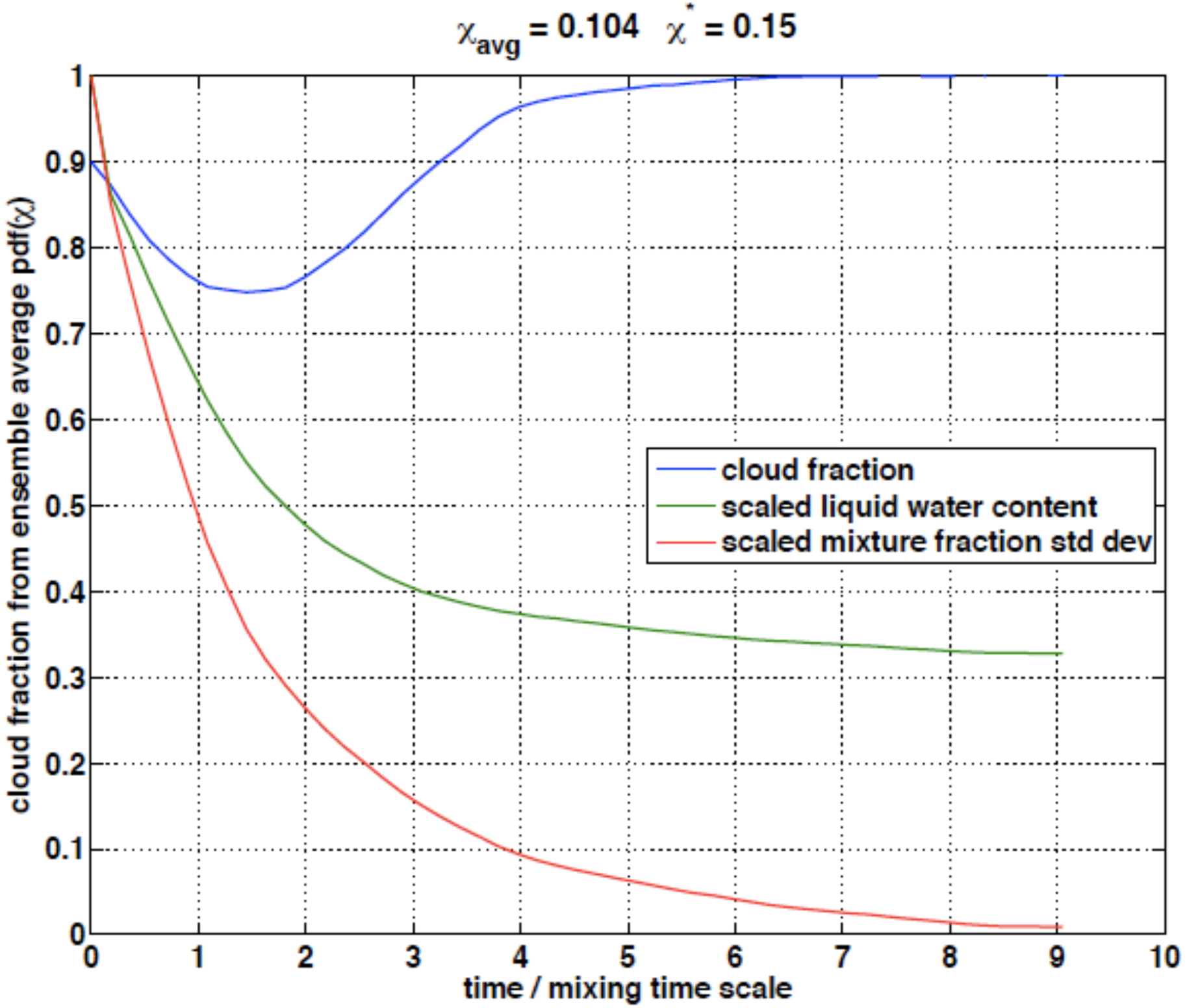

Figure 4: Evolution of cloud fraction, liquid water content, and mixture fraction std dev during mixing after entrainment of one blob of size $d/L = \bar{\chi} = 0.1$, with $\chi^* = 0.15$, based on 100 realizations of the linear eddy model.

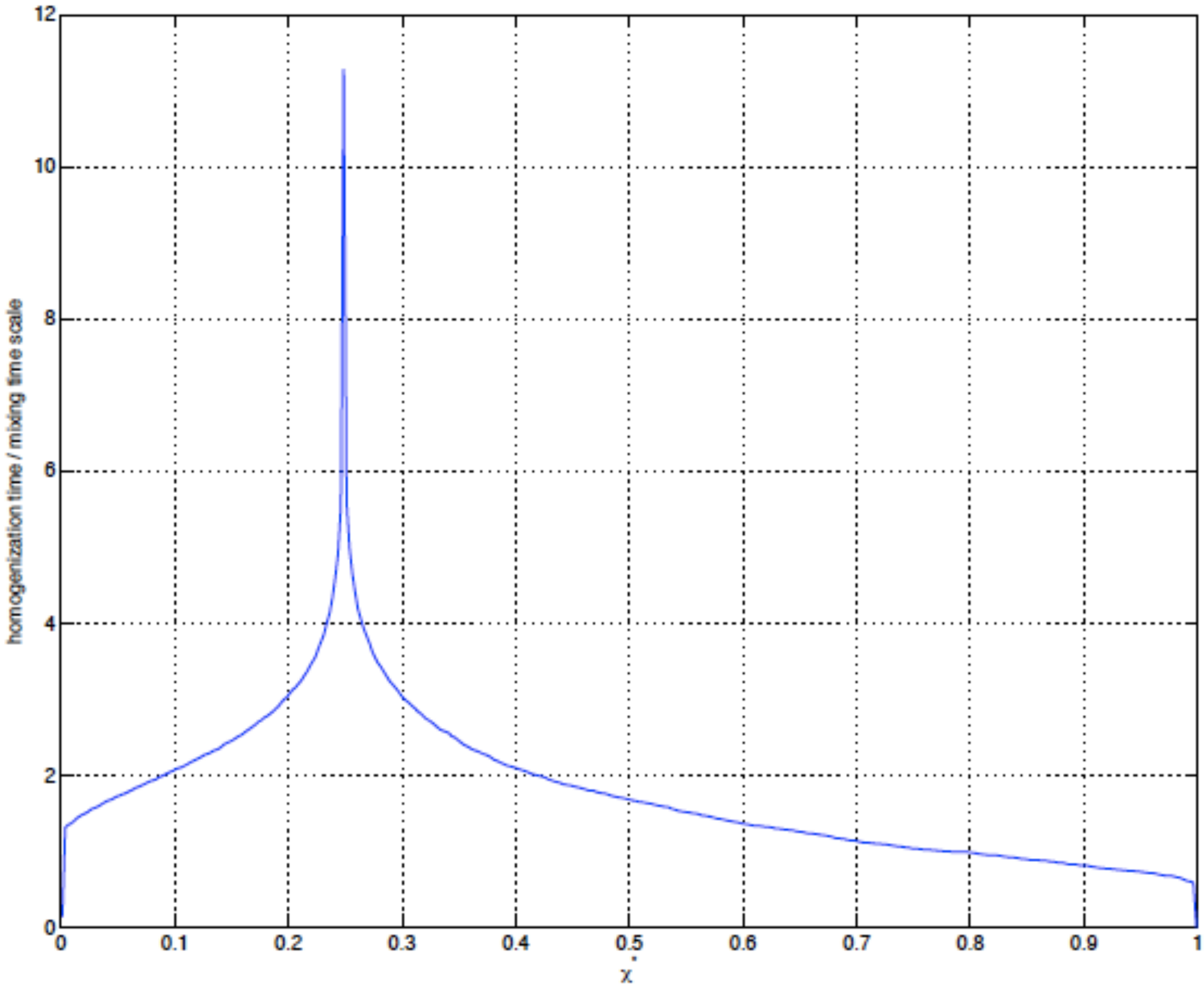

Figure 3: Average homogenization time, scaled by the mixing time scale, versus the just-saturated mixing fraction, after entrainment of one blob of size $d/L = \bar{\chi} = 0.25$, based on 100 realizations of the linear eddy model.