

Appendix B

COMPARISON OF INDIVIDUAL MEASUREMENTS AND PREDICTIONS FOR CFAST

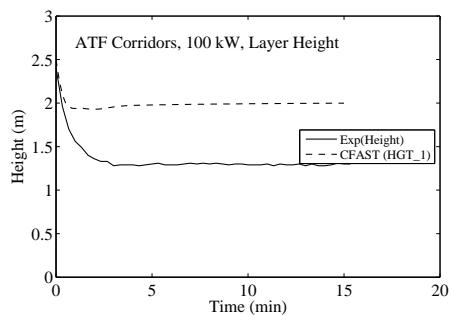
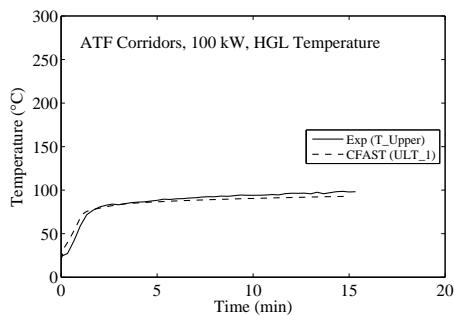
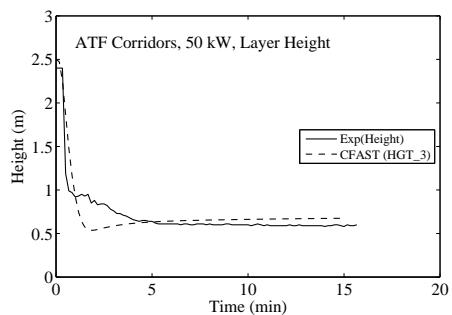
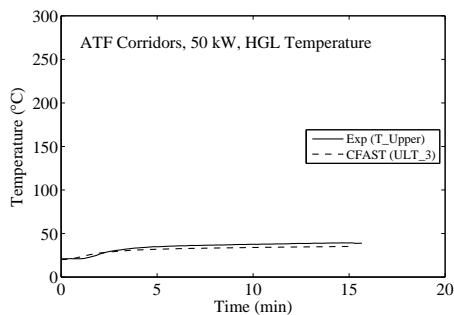
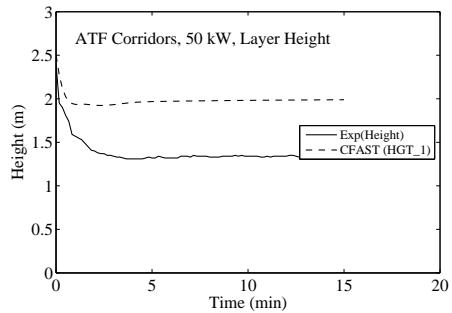
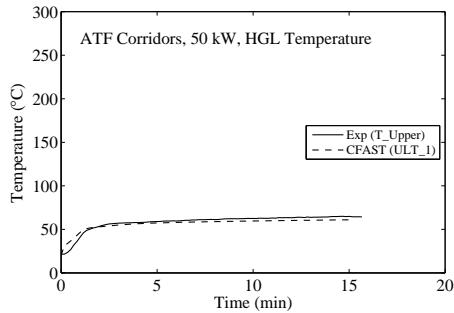
For CFAST, this document contains individual comparisons of measured vs. predicted quantities that are contained in NUREG 1824 Supplement 1. The results for each test from each validation set are presented in the following sections and are organized by experimental data set, then by output quantity. Refer to NIST SP 1086¹ for more details on the validation of the model.

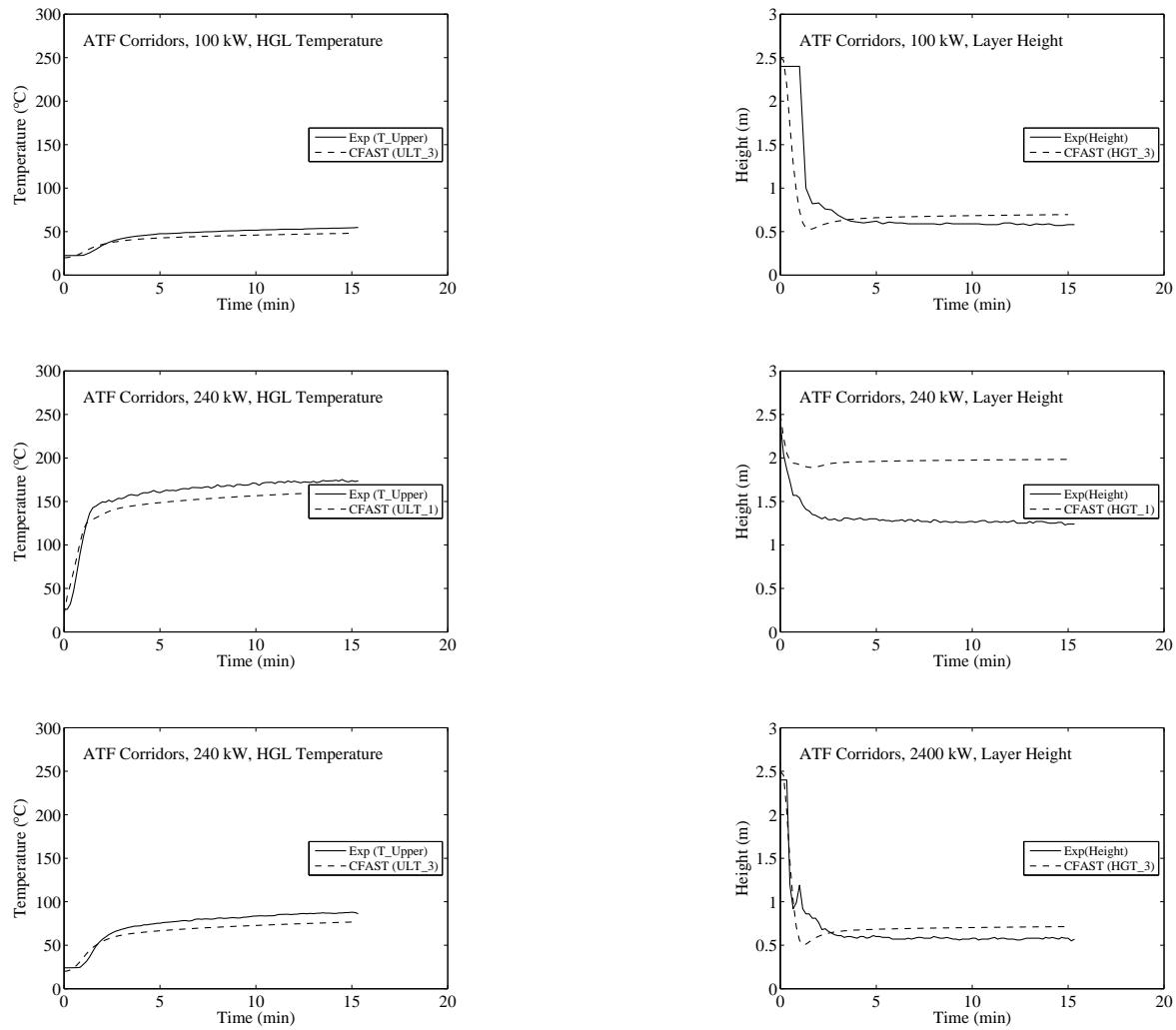
¹Peacock, R. D. and P. A. Reneke, CFAST – Consolidated Model of Fire Growth and Smoke Transport (Version 6), Software Development and Model Evaluation Guide, NIST Special Publication 1086, National Institute of Standards and Technology, Gaithersburg, MD, 2013.

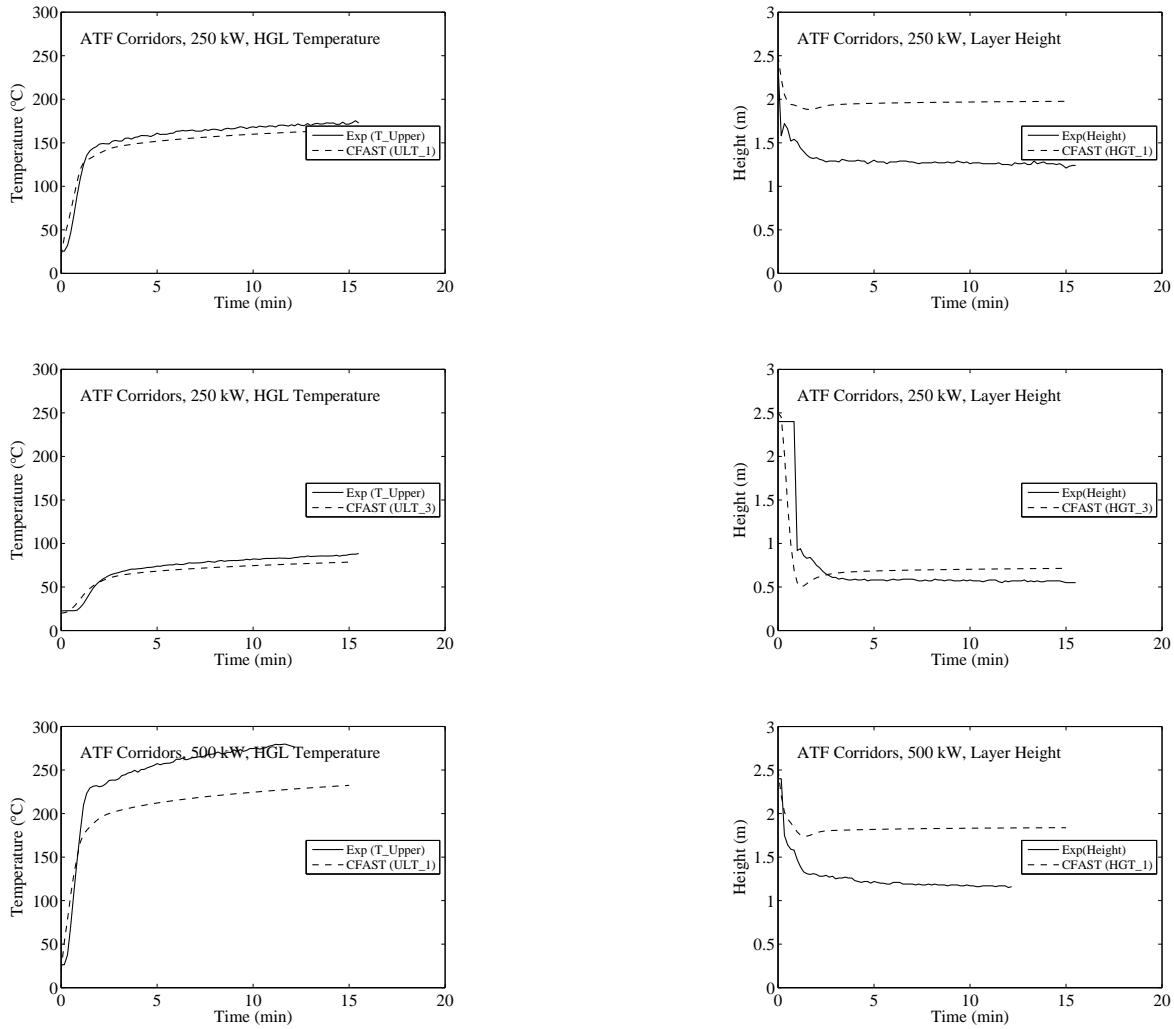
Contents

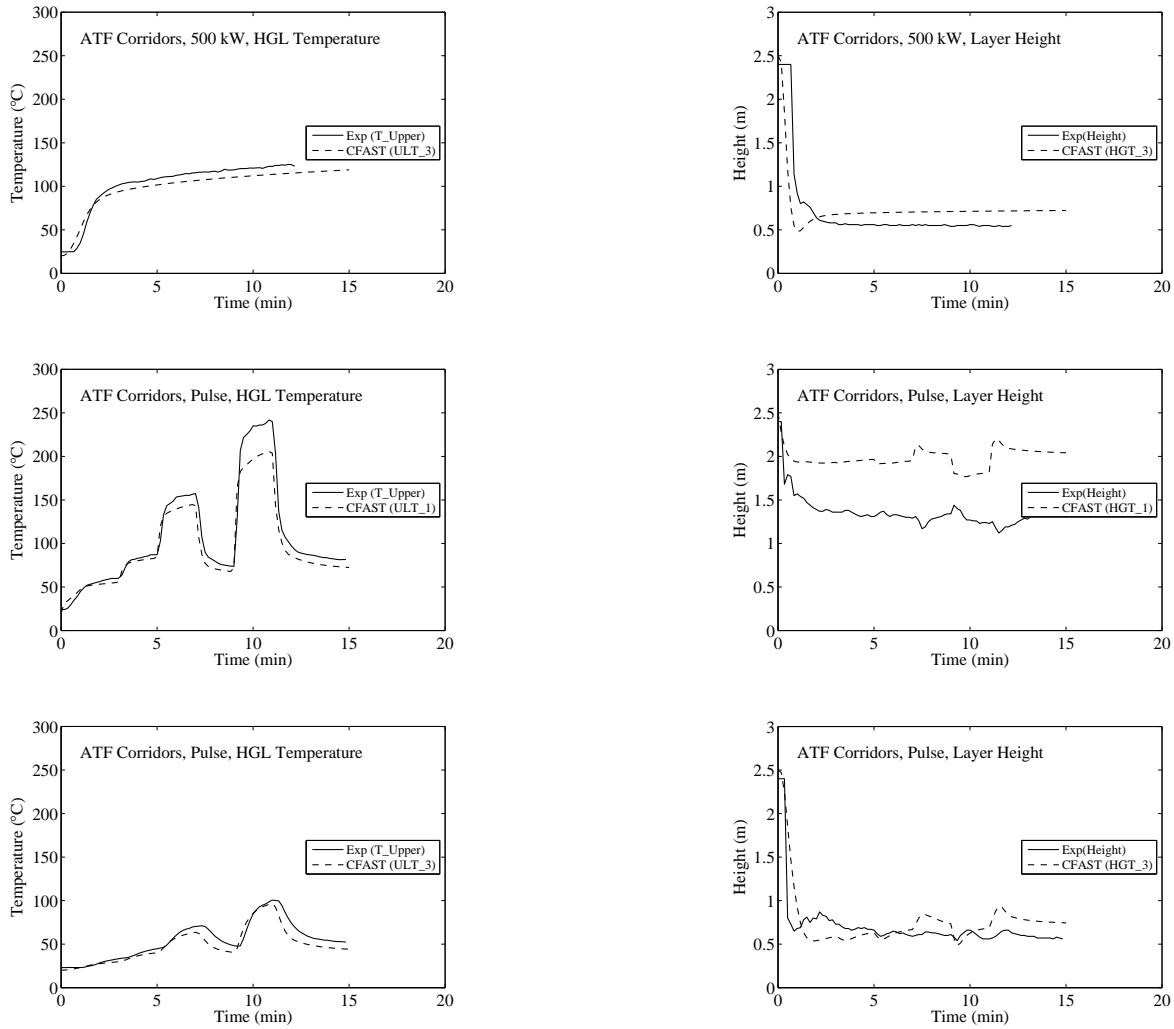
List of Experimental Data Sets	B-2
B Appendix B	B-3
B.1 ATF Corridors	B-3
B.2 FM/SNL Test Series	B-8
B.3 iBMB Compartment Tests	B-19
B.4 LLNL Enclosure Series	B-20
B.5 NBS Multi-Compartment Test Series	B-28
B.6 NIST Smoke Alarm Experiments	B-31
B.7 NIST/NRC Test Series	B-32
B.8 SP Adiabatic Surface Temperature Experiments	B-77
B.9 Steckler Compartment Experiments	B-81
B.10 UL/NFPRF Series I Experiments	B-88
B.11 UL/NIST Vent Experiments	B-91
B.12 USN High Bay Hangar Experiments	B-93
B.13 Vettori Flat Ceiling Experiments	B-97
B.14 VTT Large Hall Tests	B-103
B.15 WTC Test Series	B-105

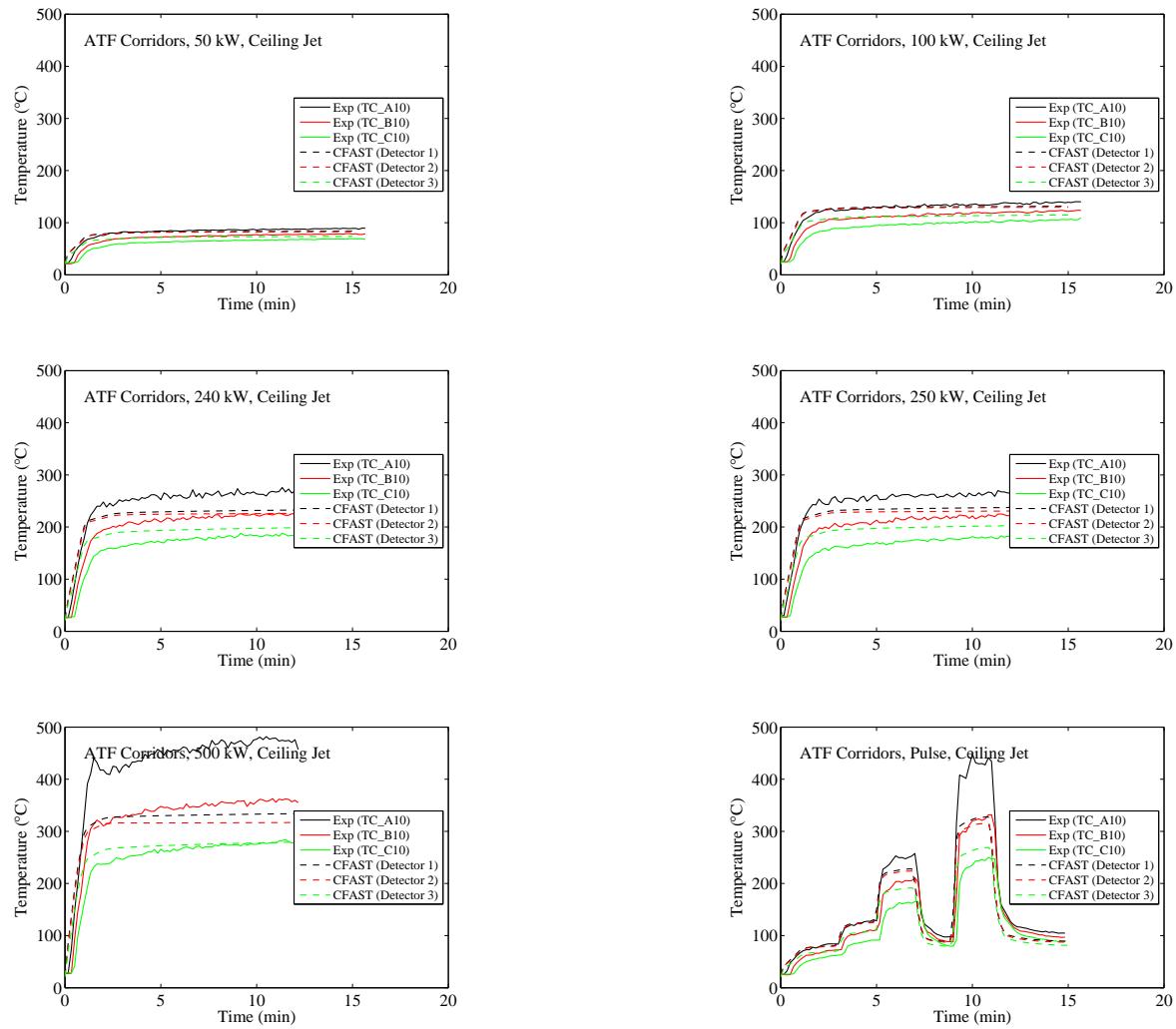
B.1 ATF Corridors



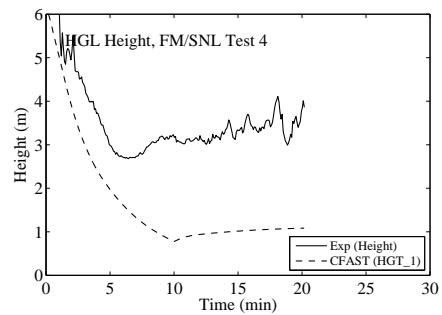
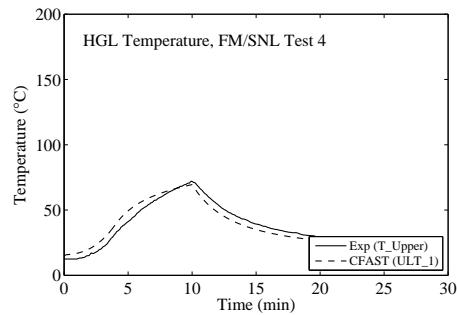
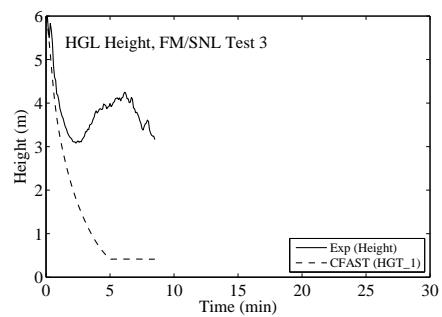
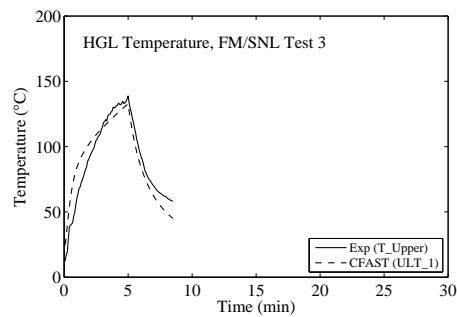
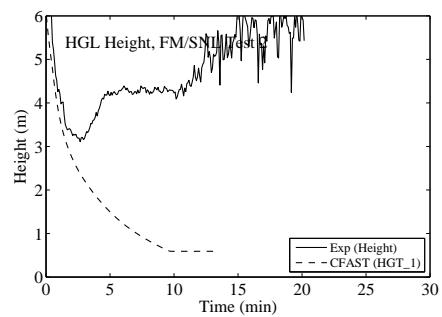
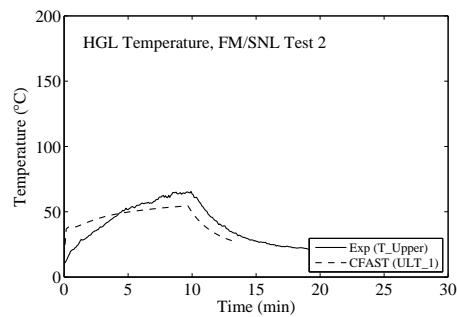
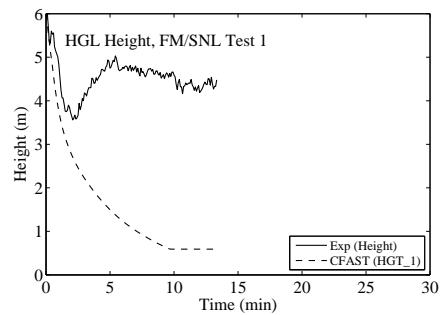
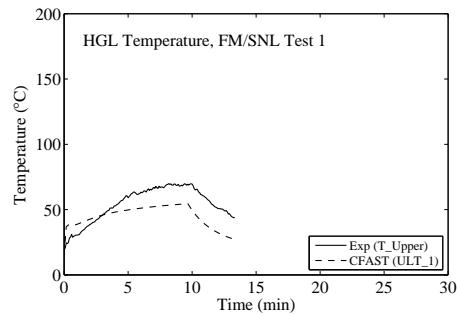


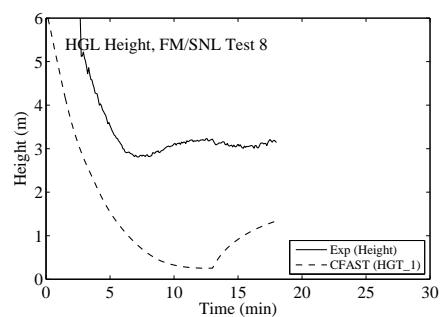
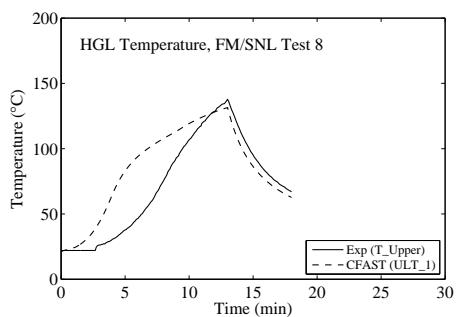
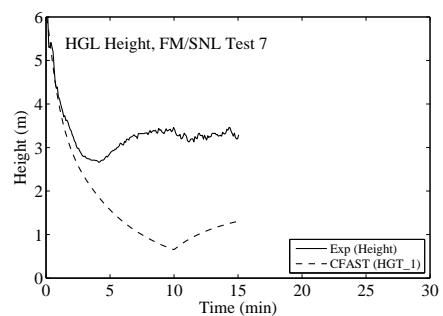
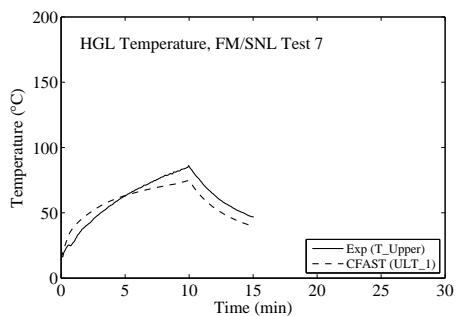
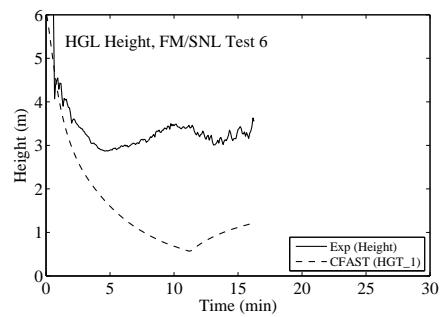
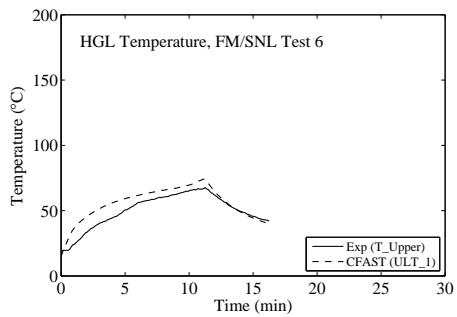
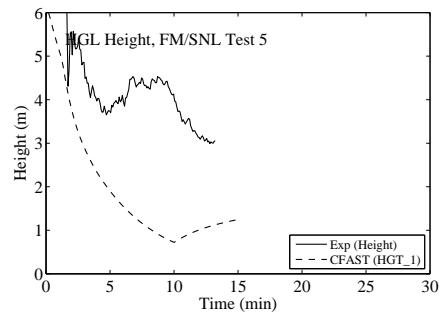
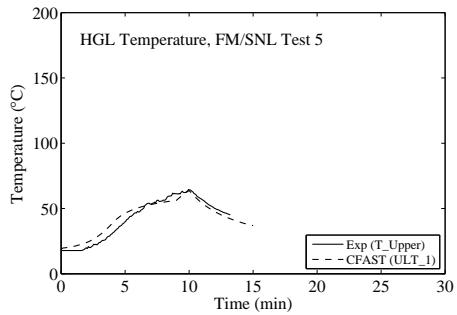


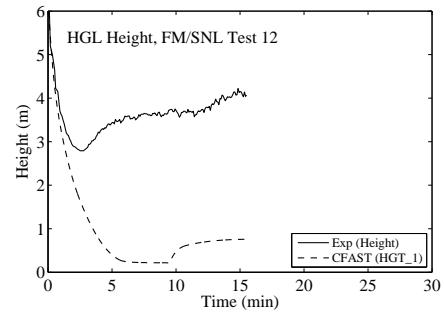
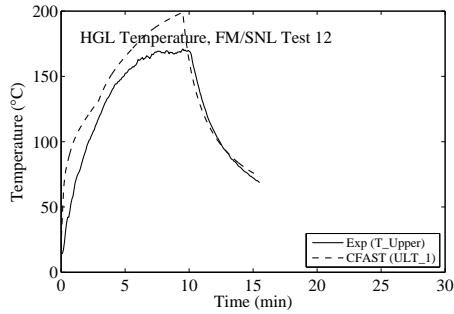
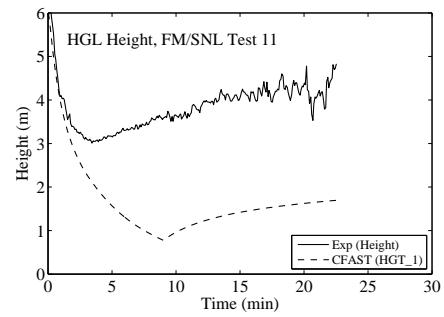
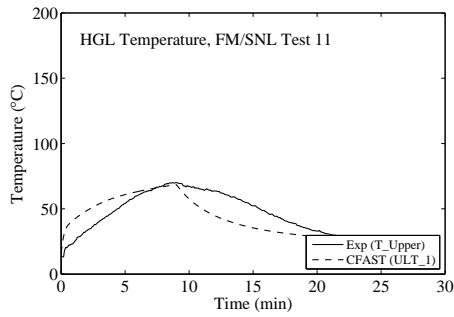
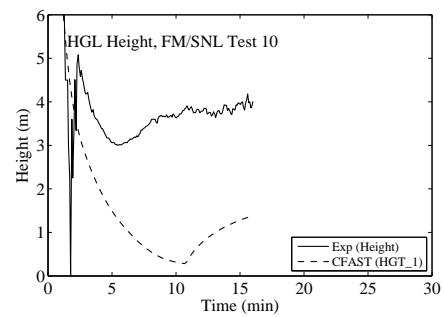
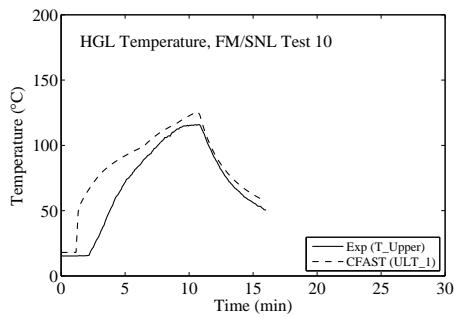
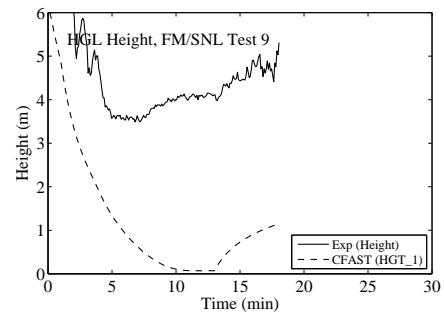
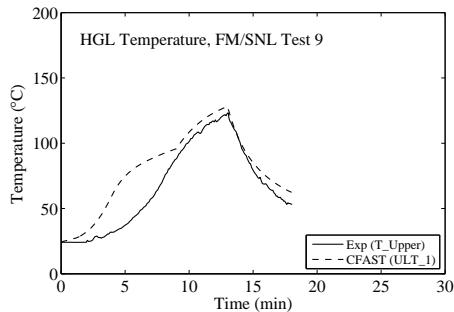


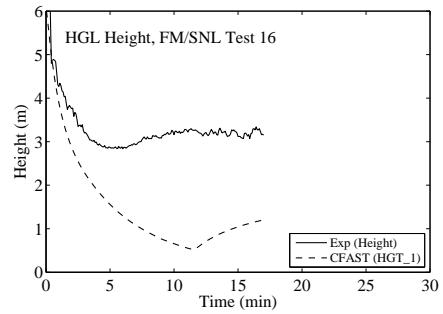
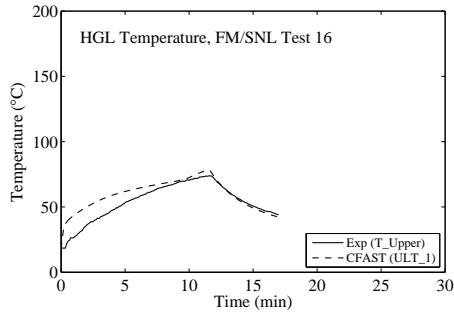
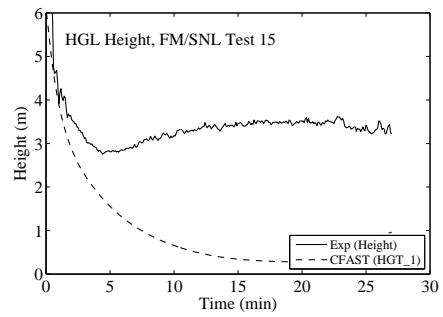
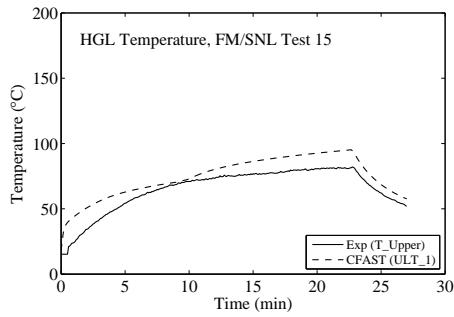
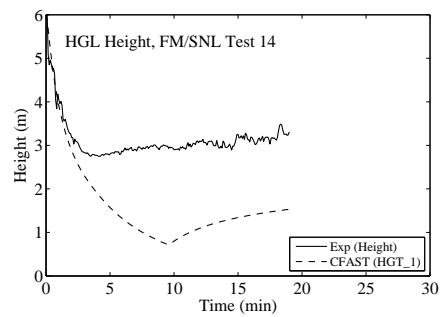
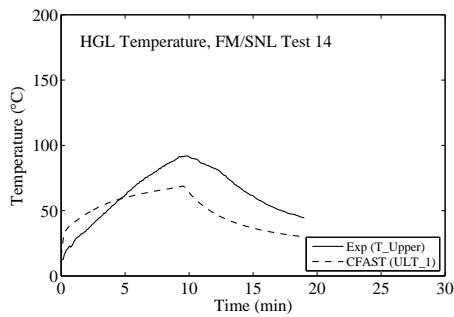
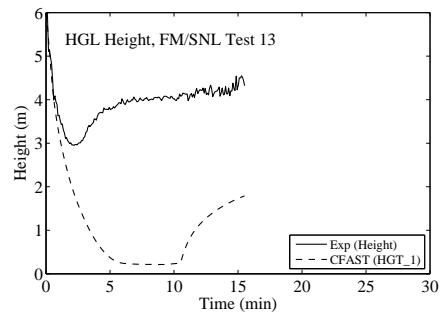
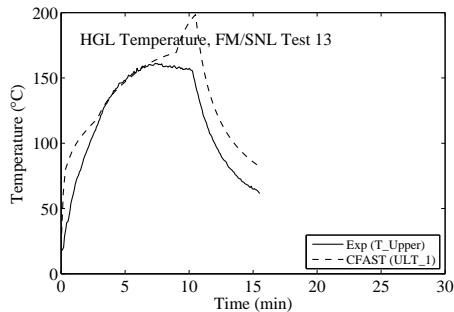


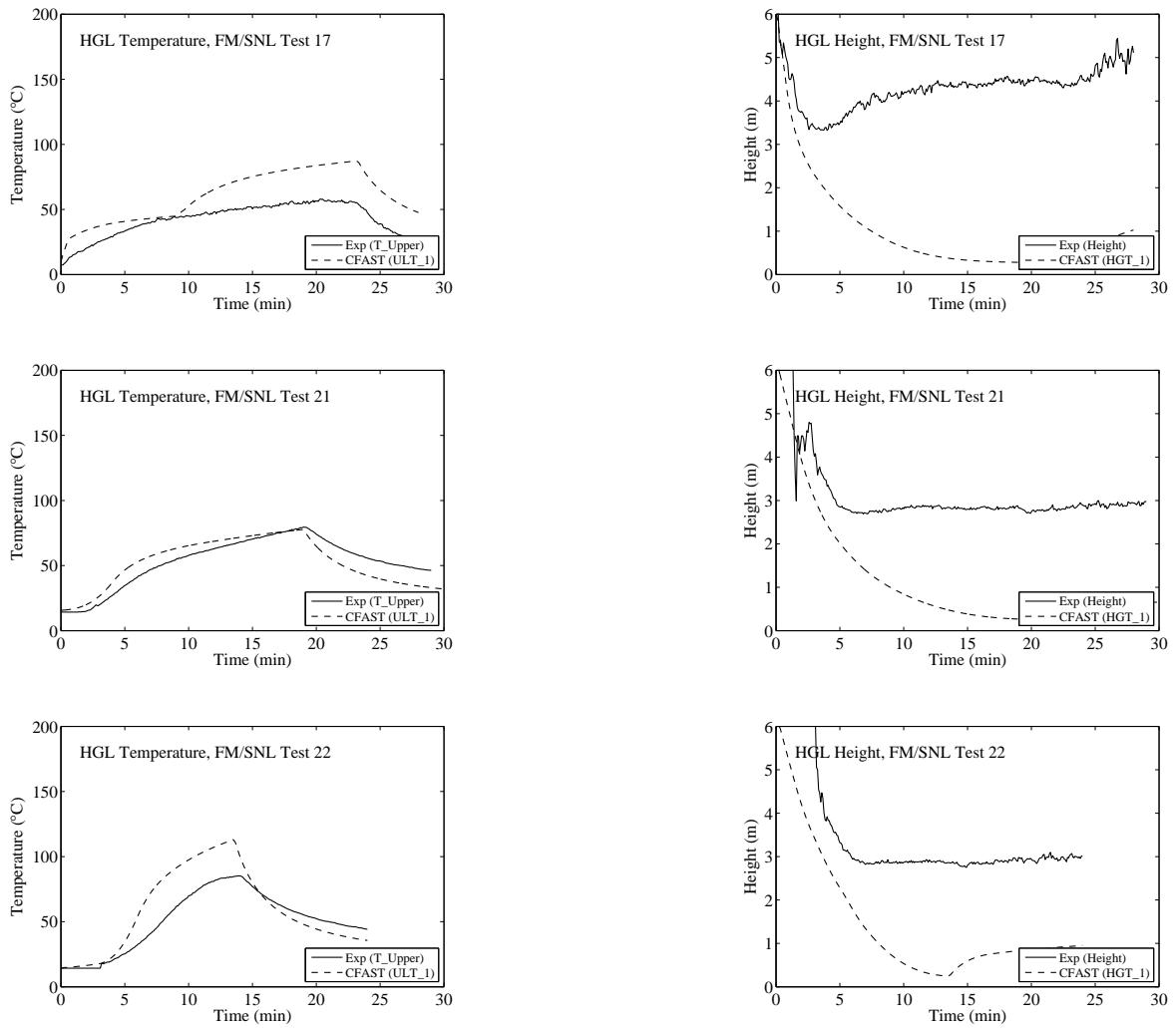
B.2 FM/SNL Test Series

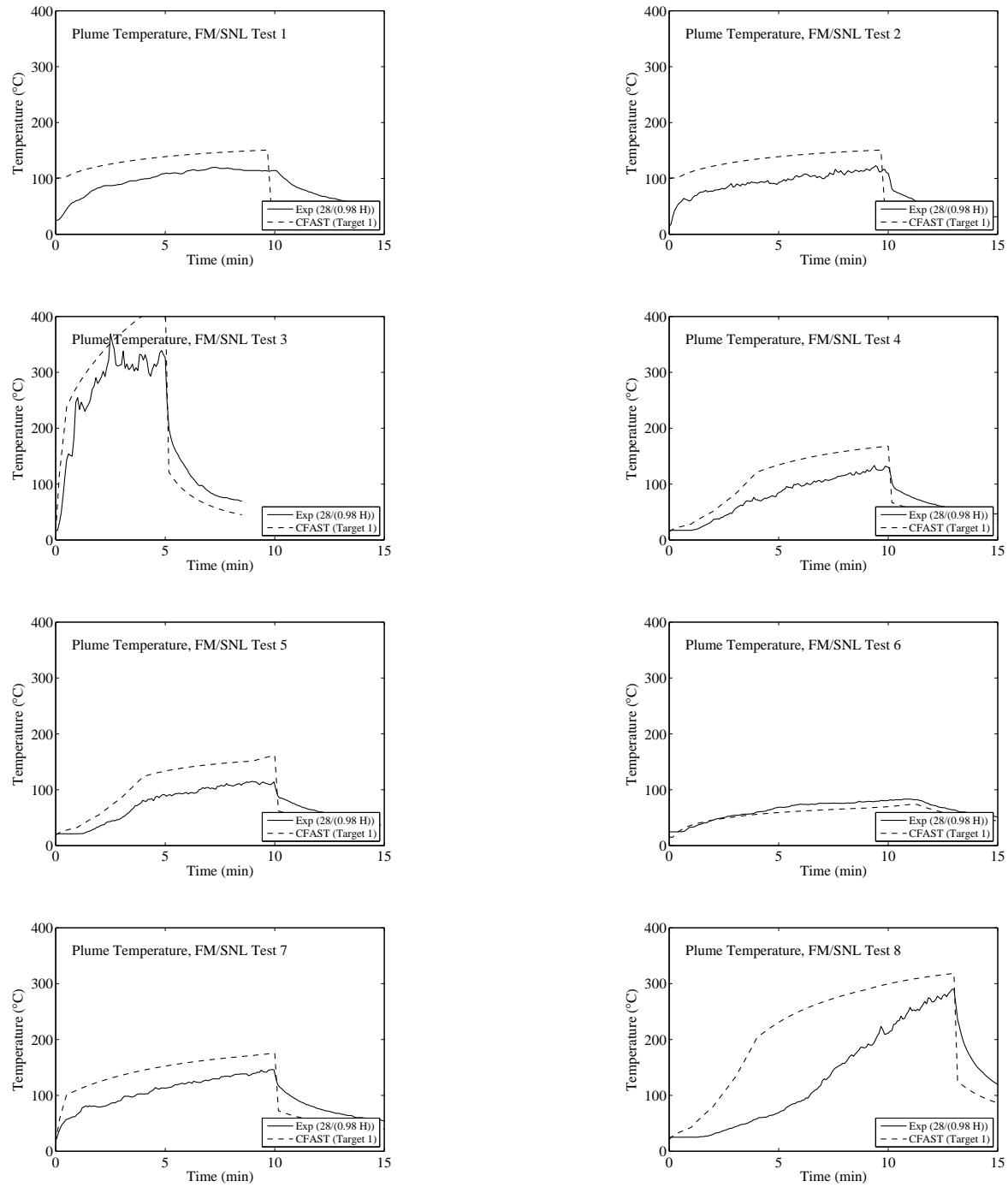


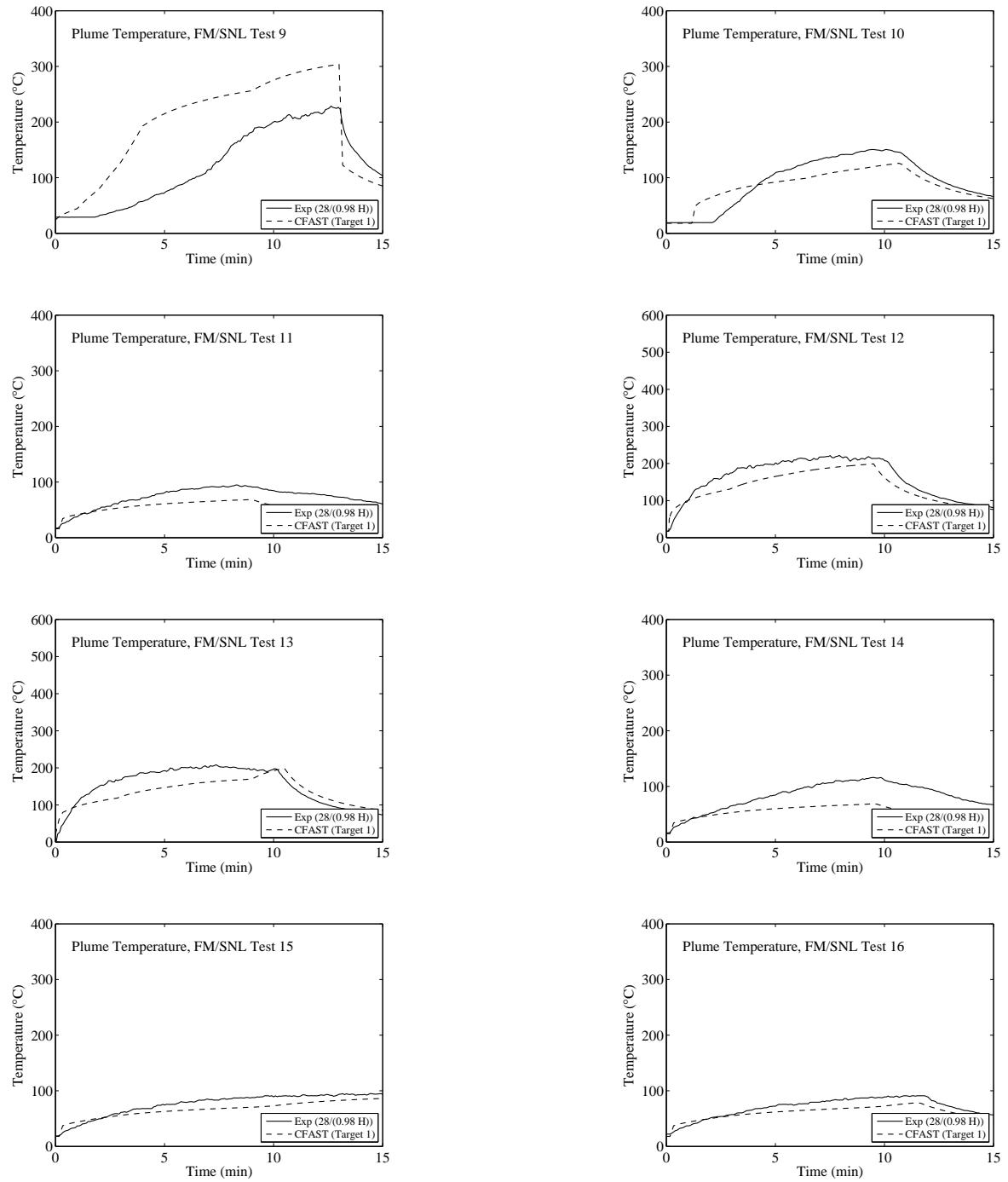


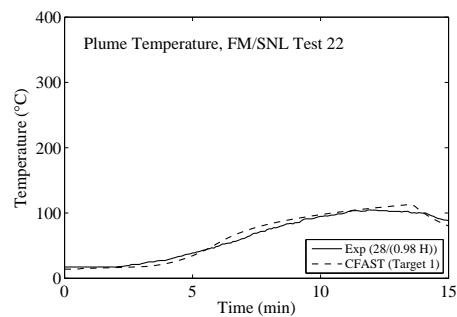
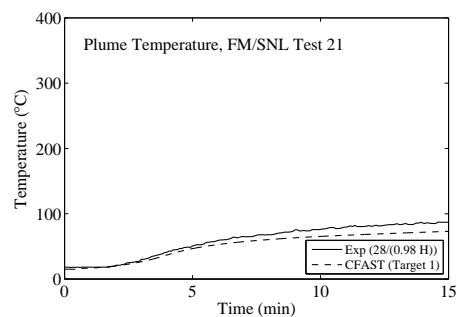
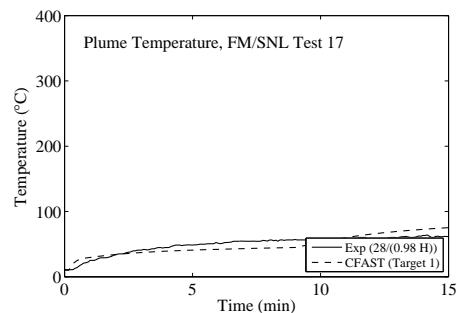


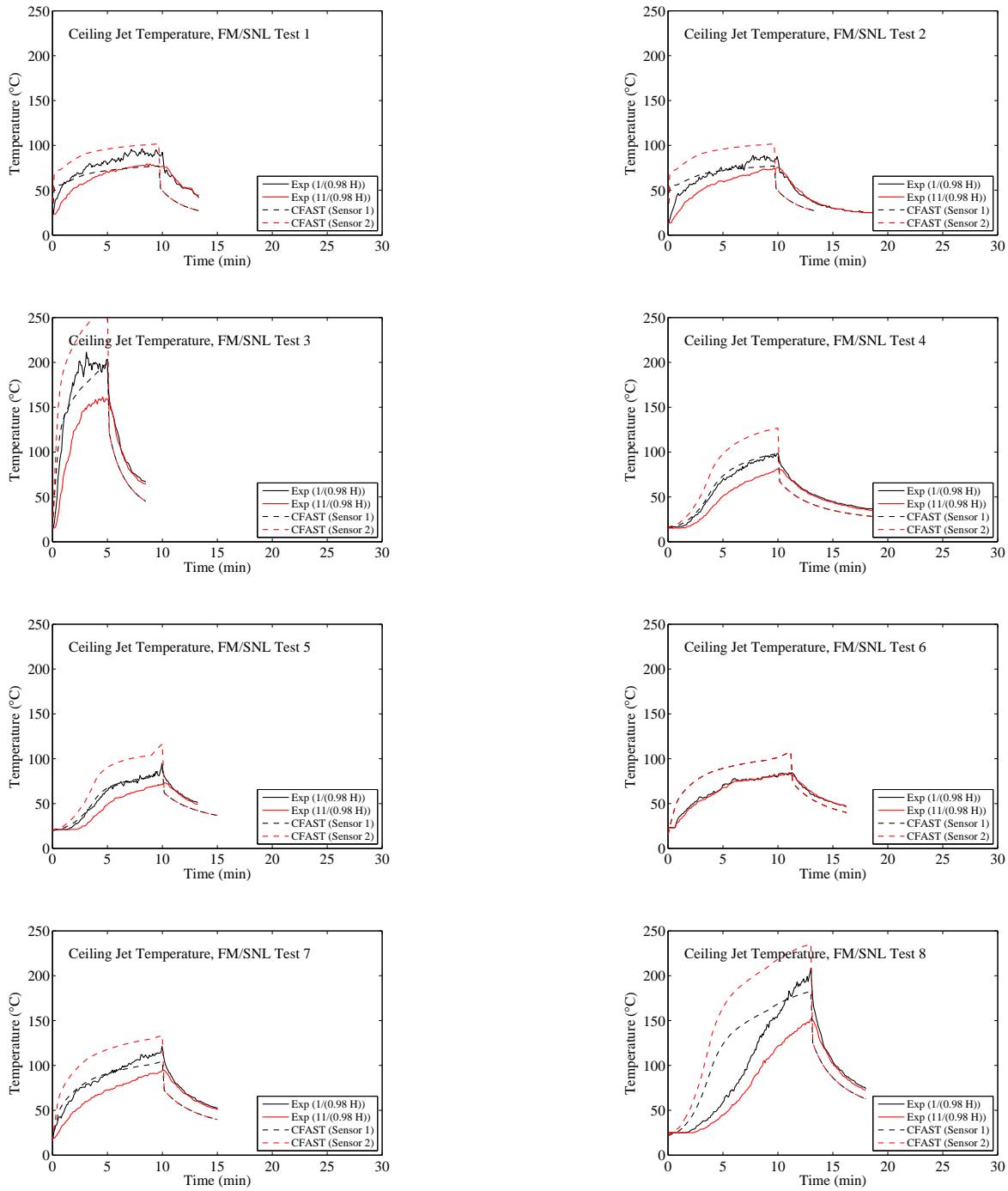


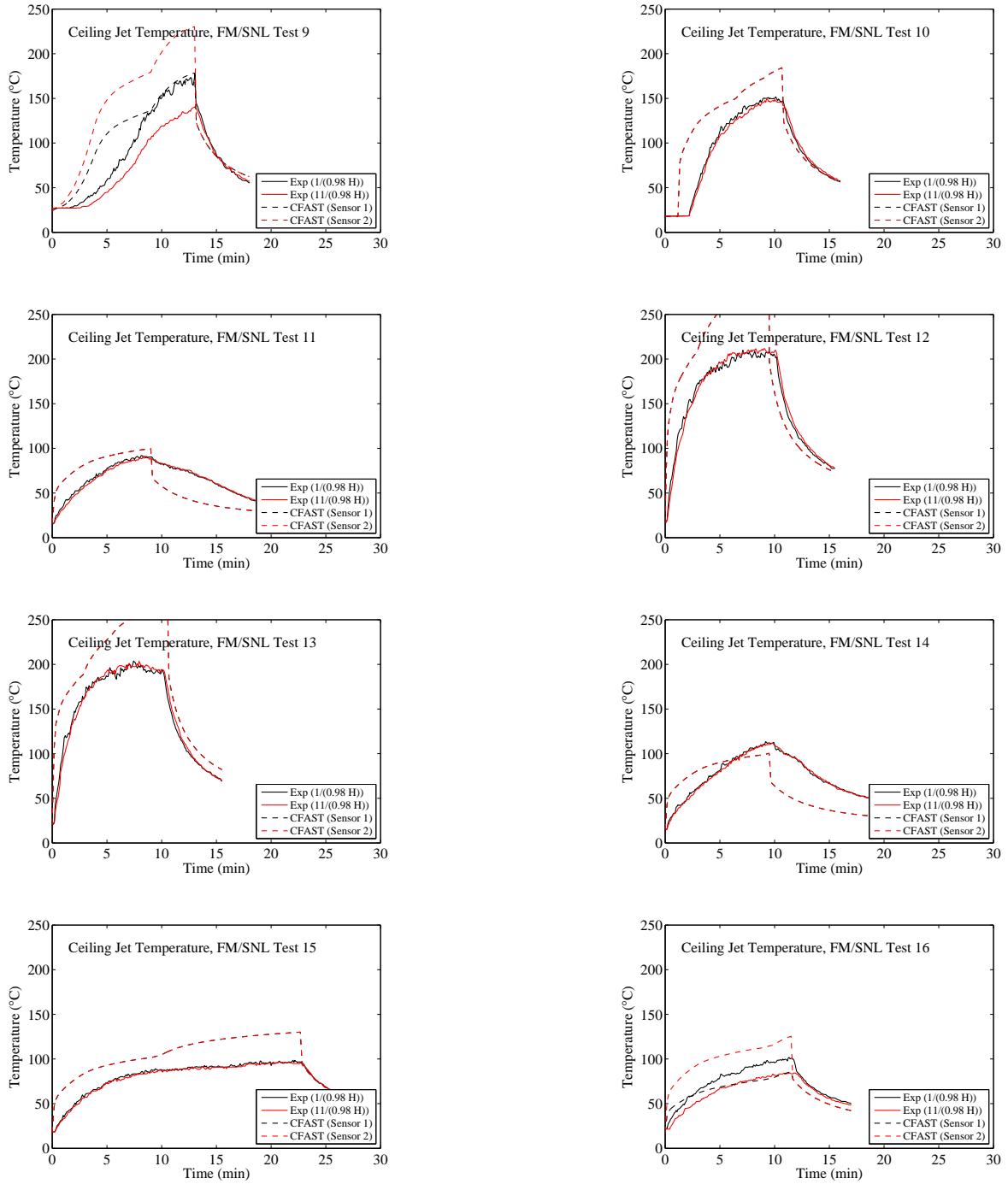


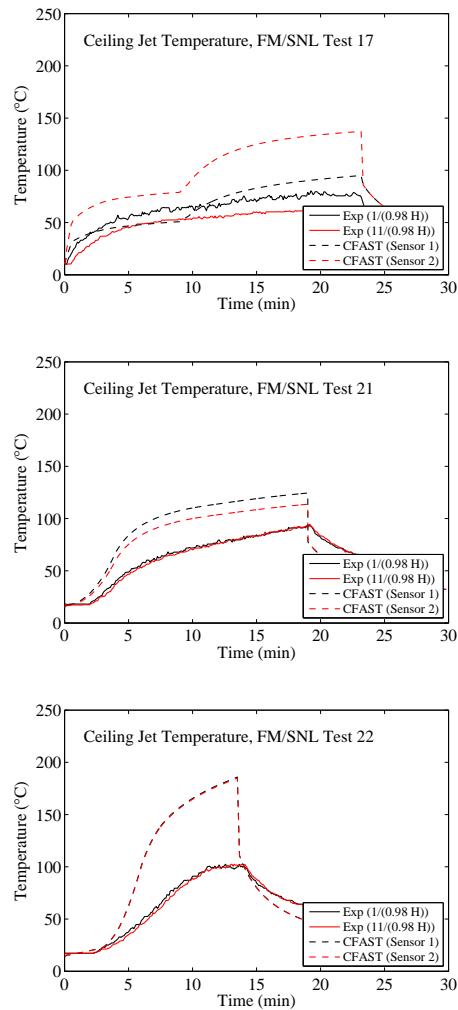




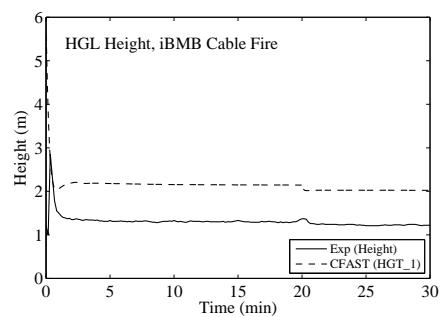
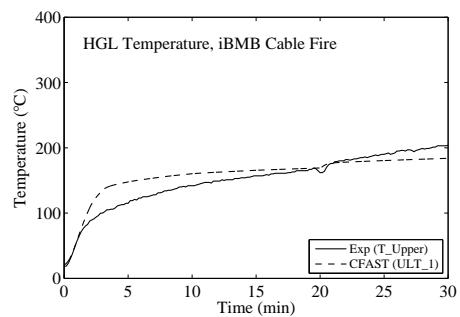
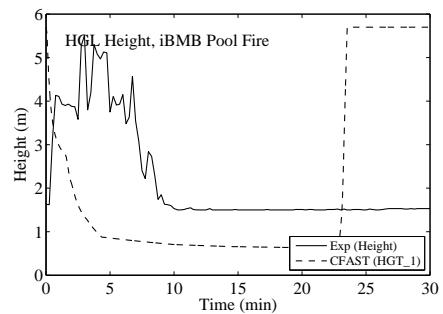
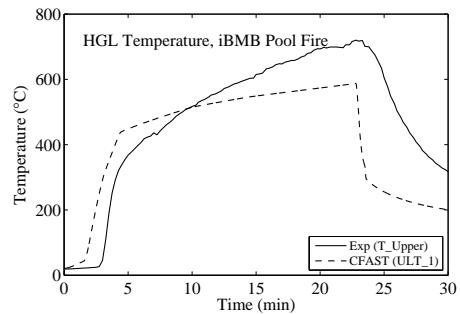




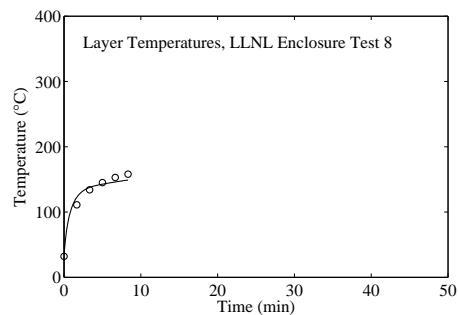
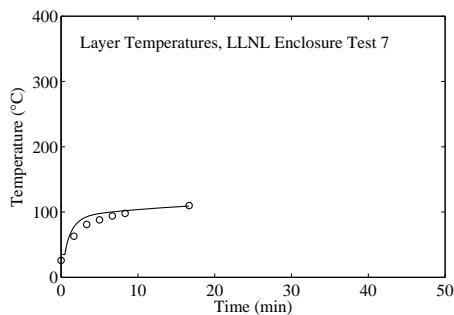
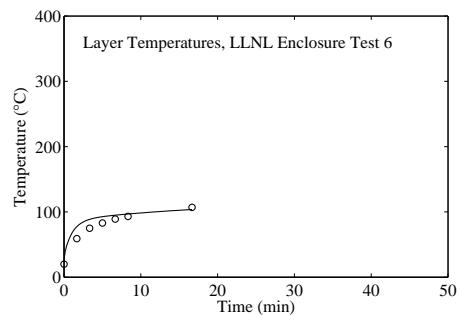
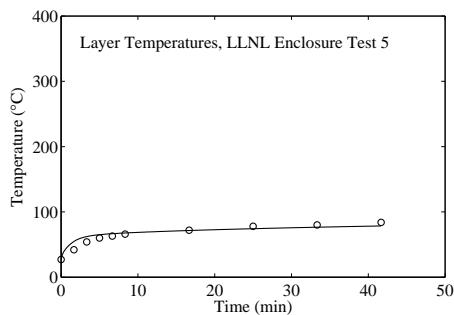
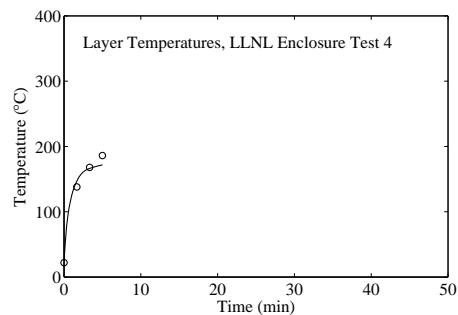
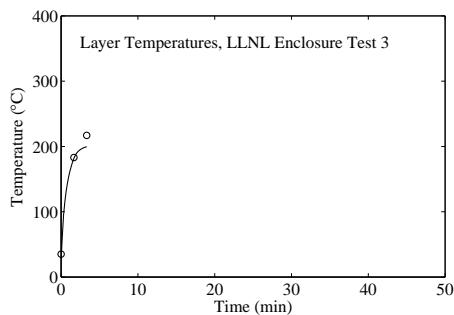
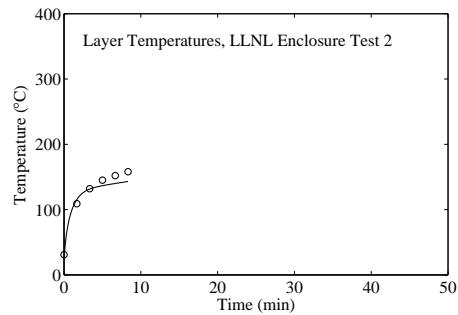
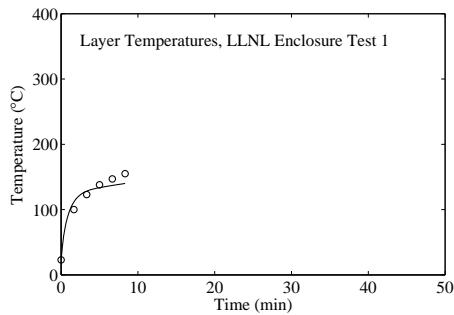


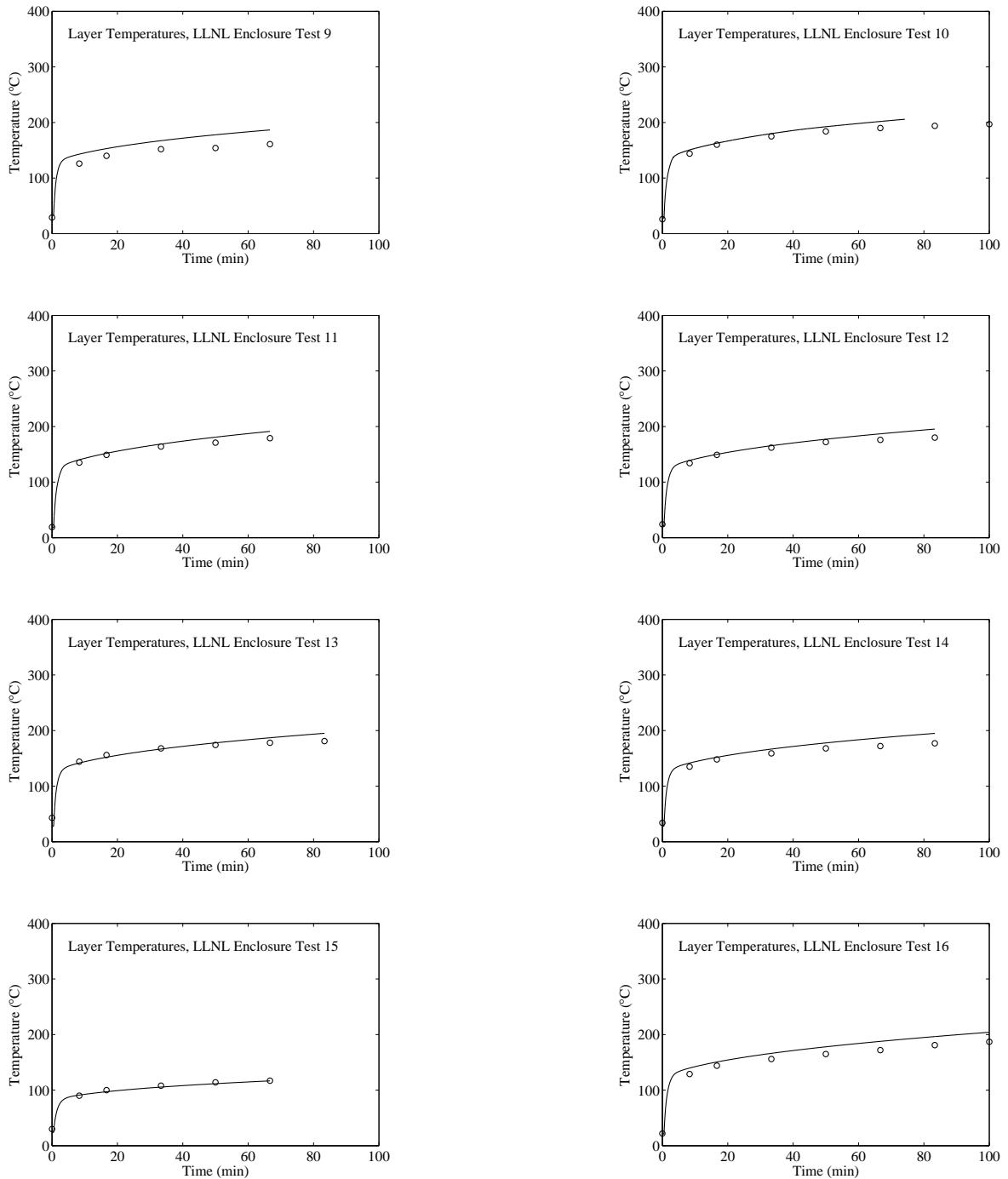


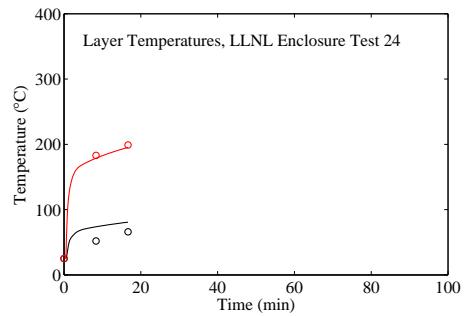
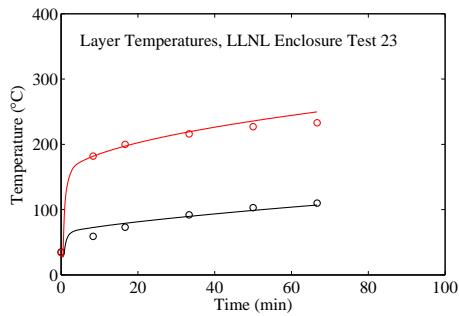
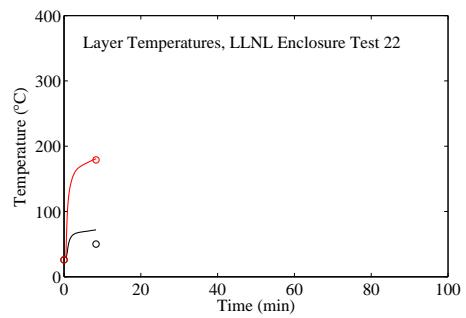
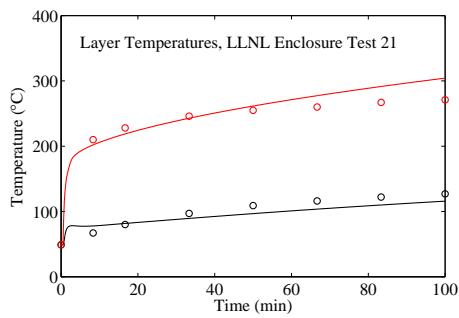
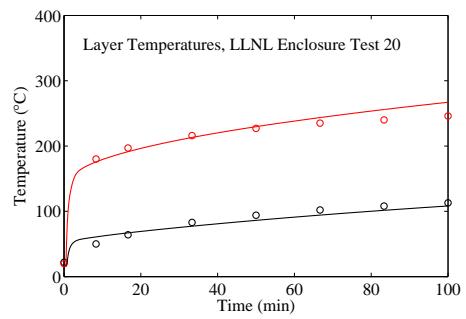
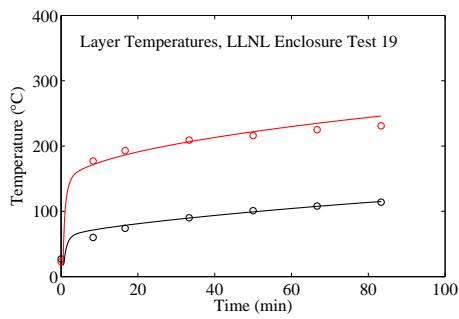
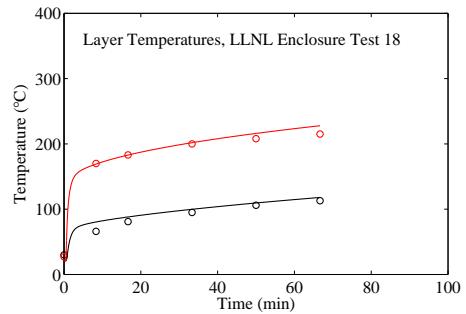
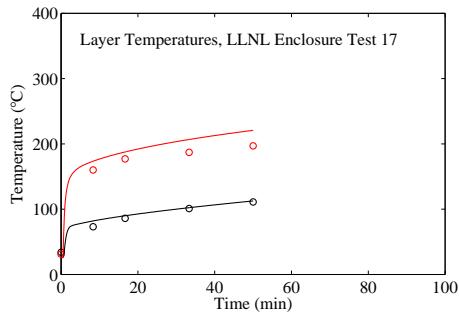
B.3 iBMB Compartment Tests

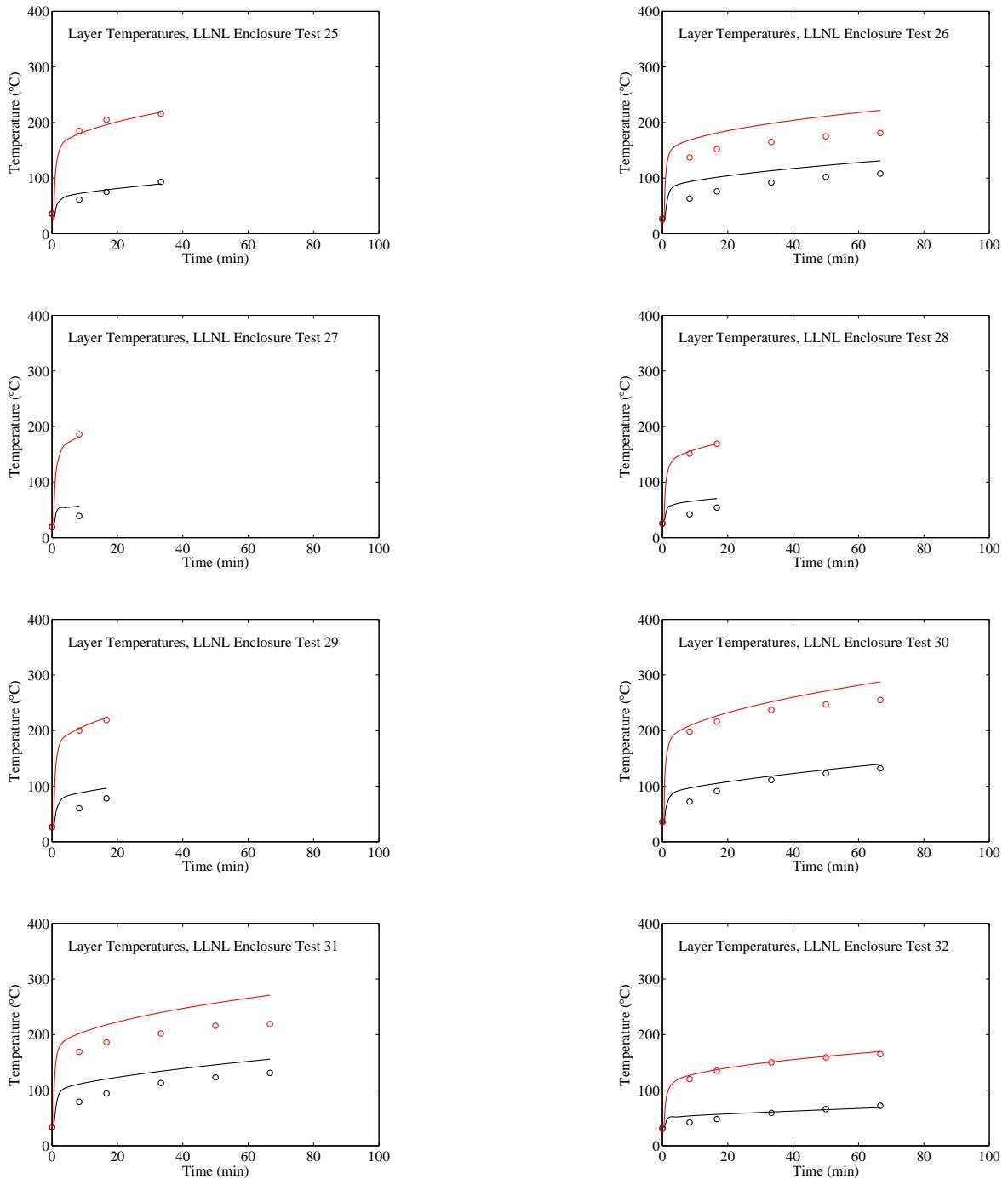


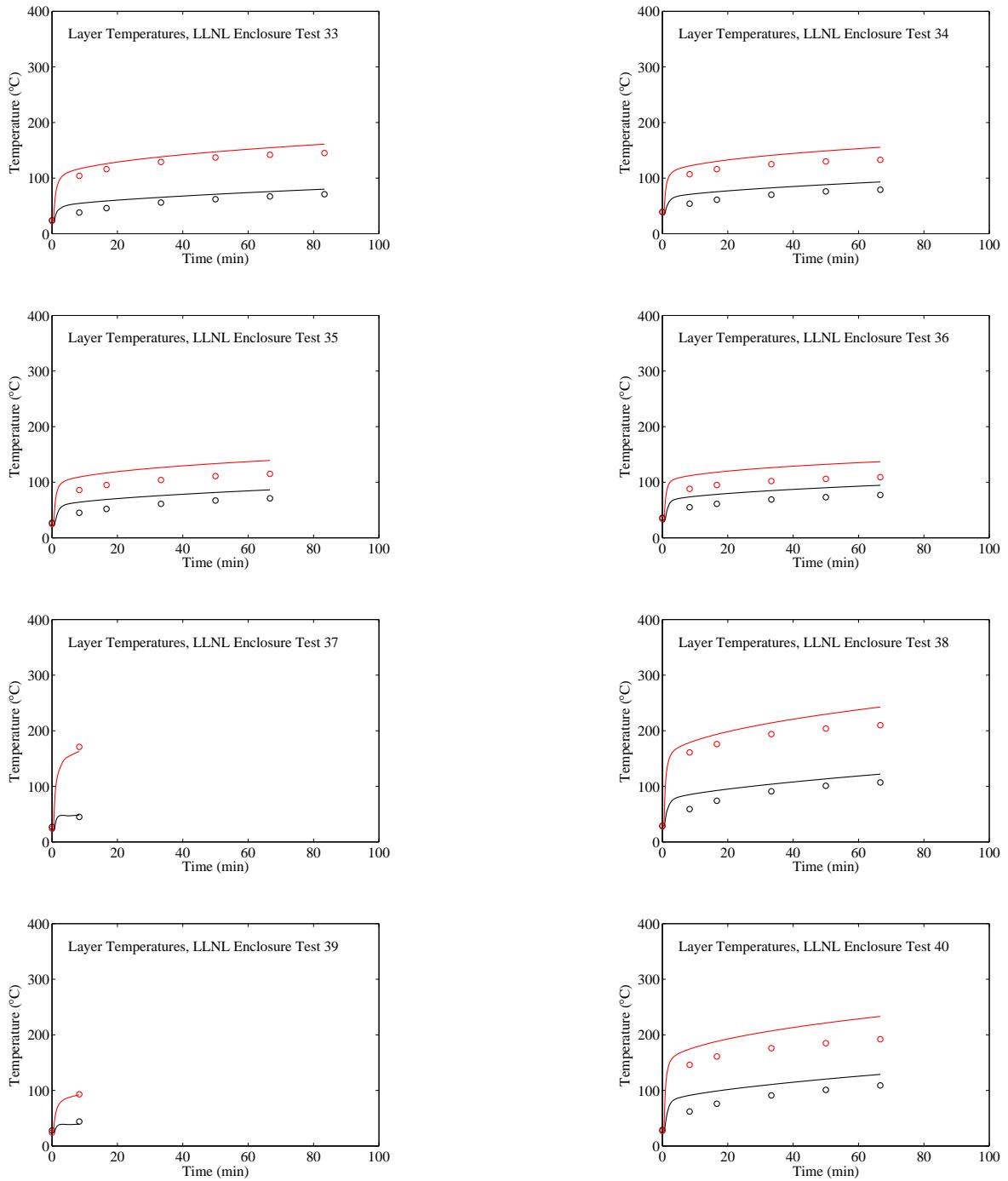
B.4 LLNL Enclosure Series

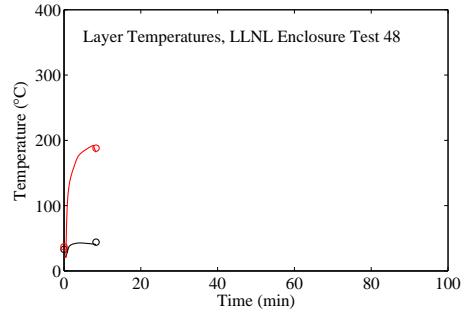
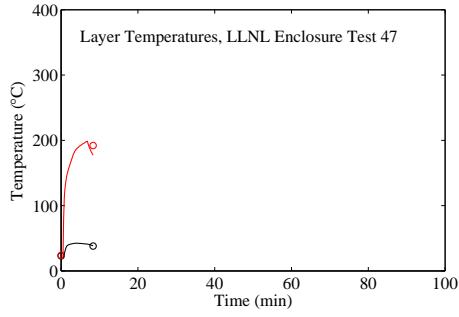
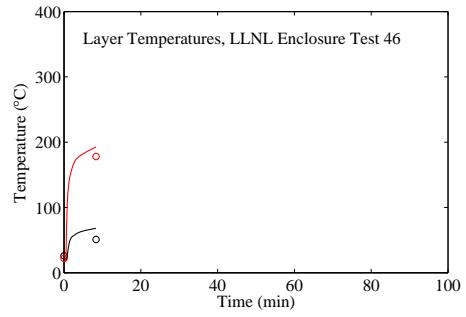
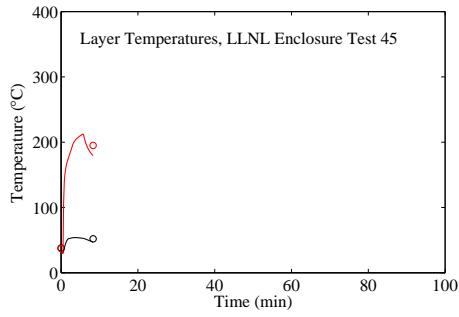
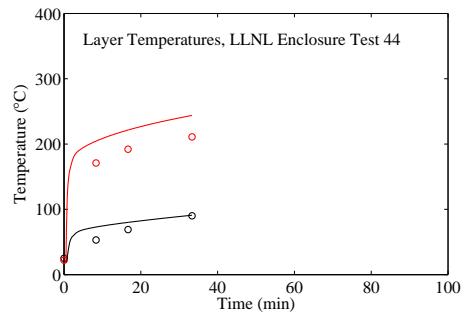
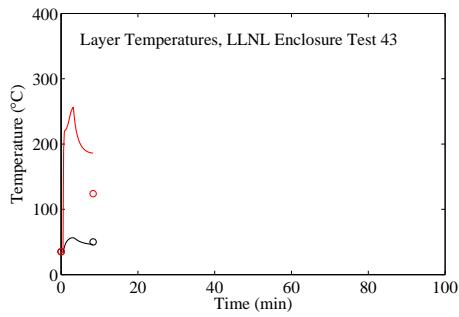
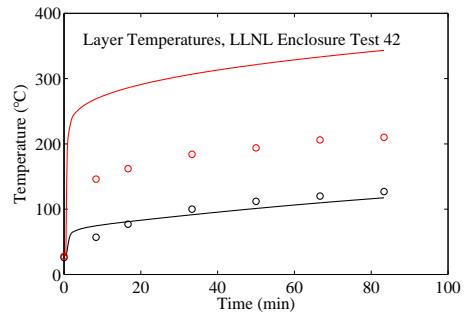
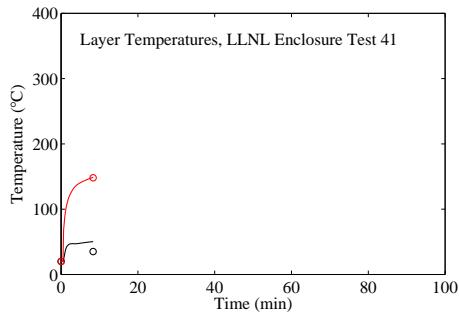


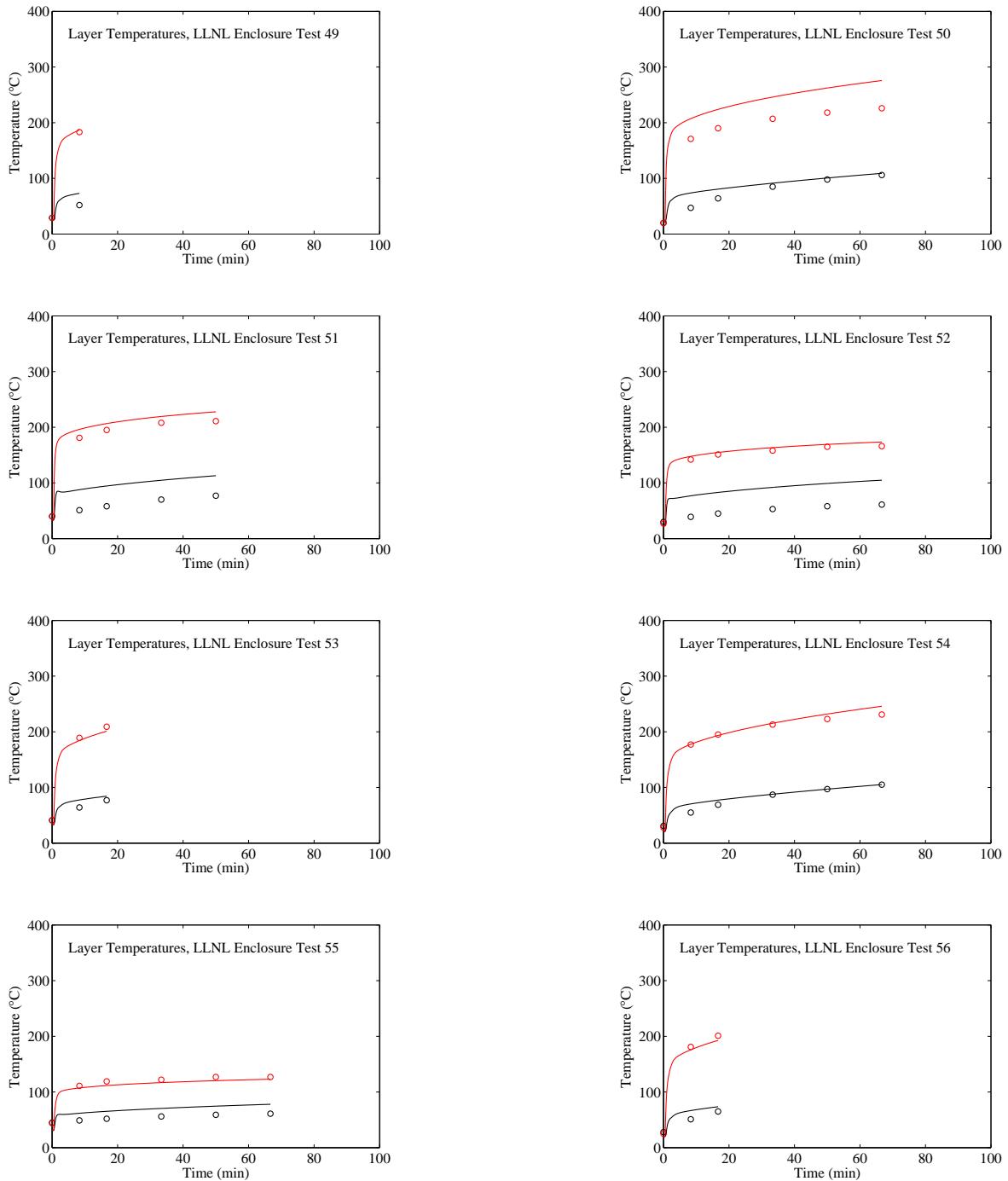


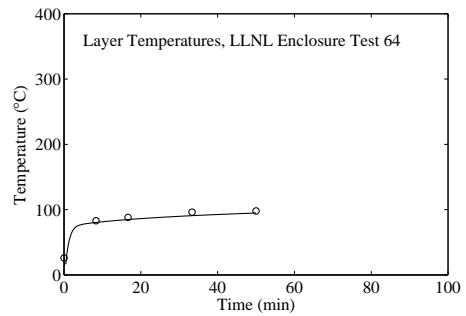
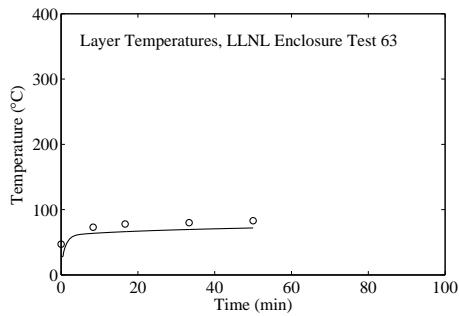
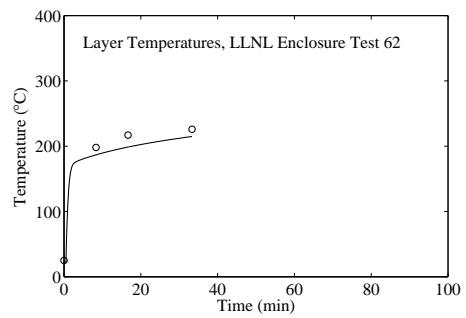
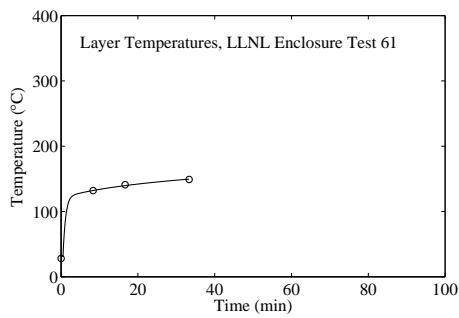
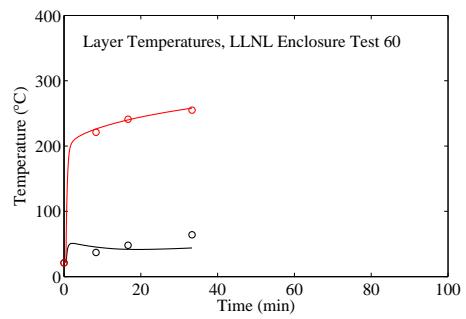
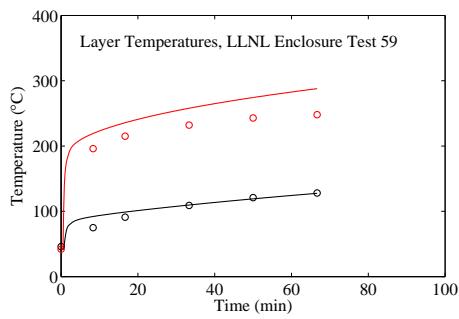
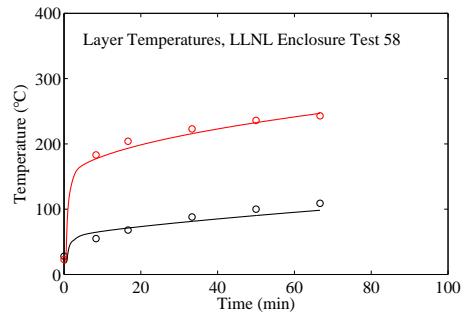
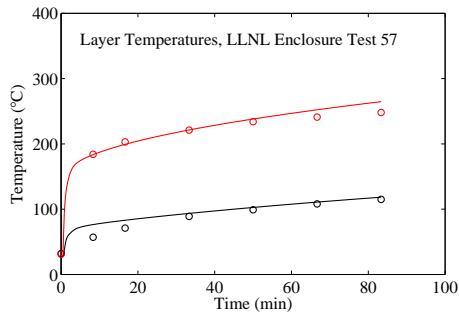




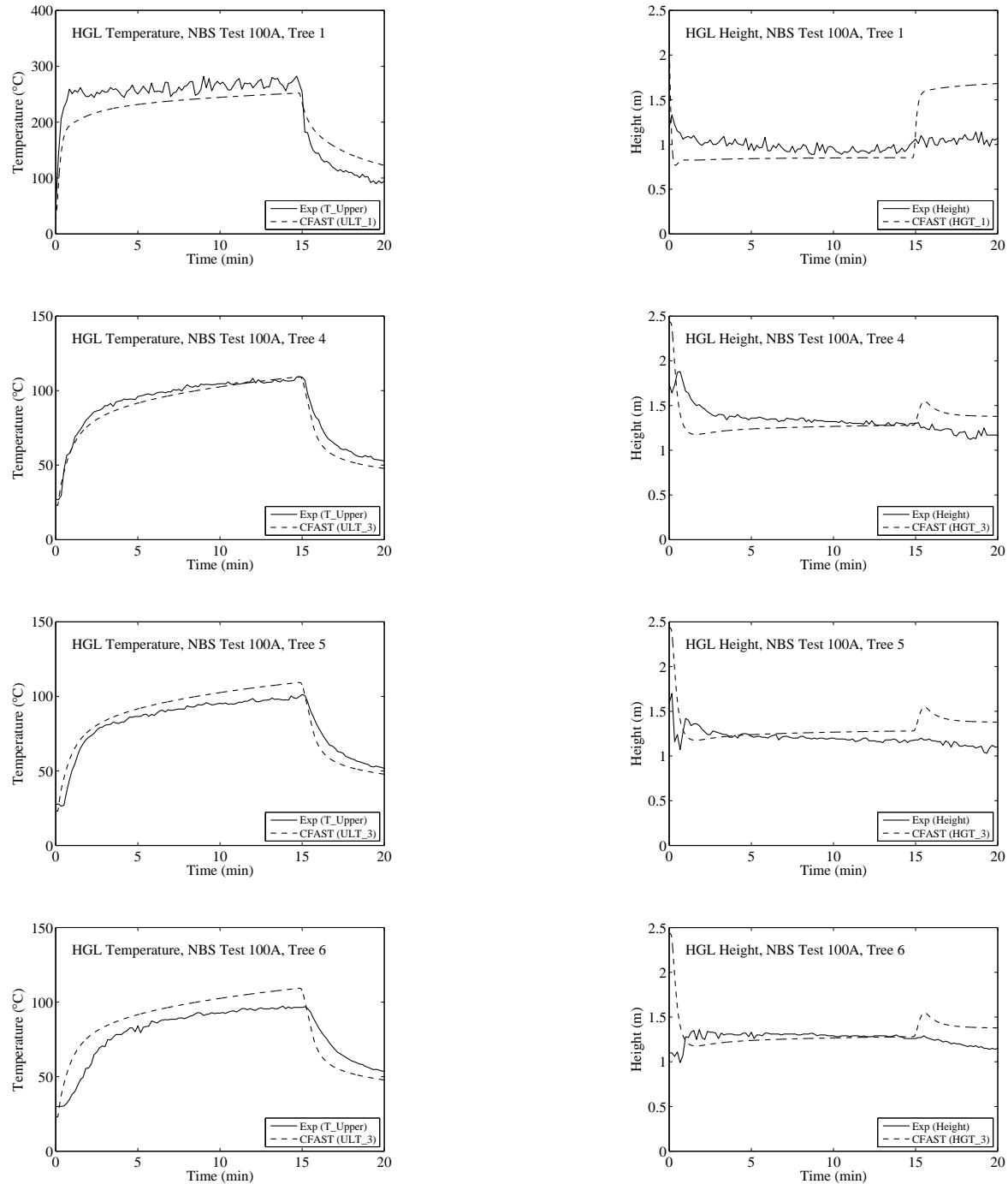




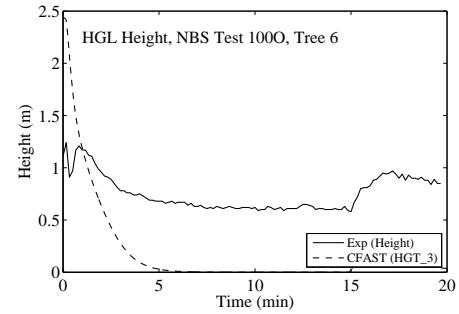
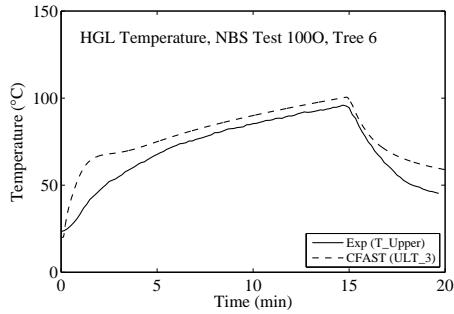
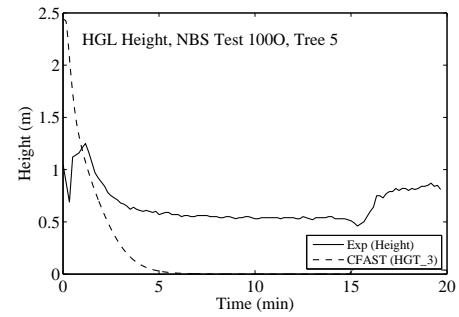
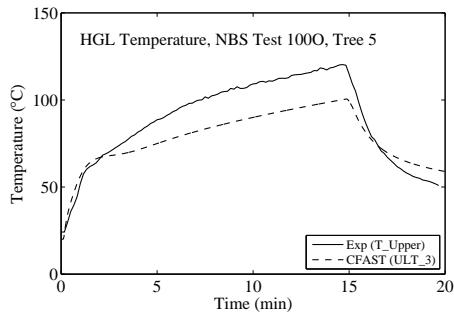
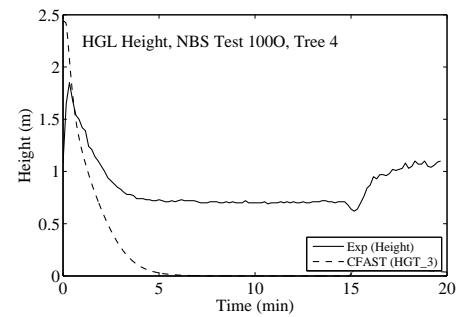
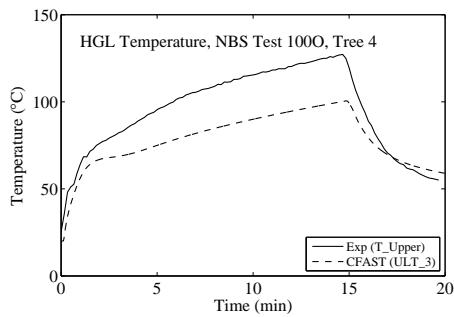
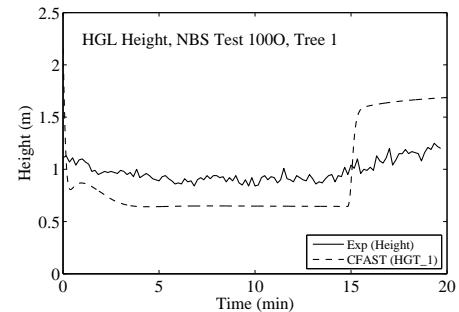
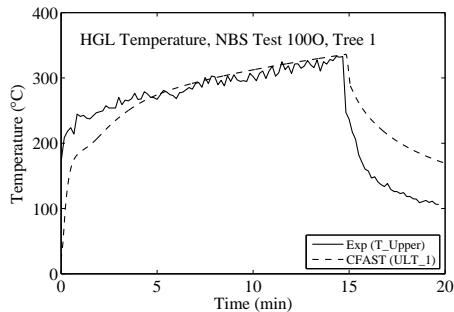




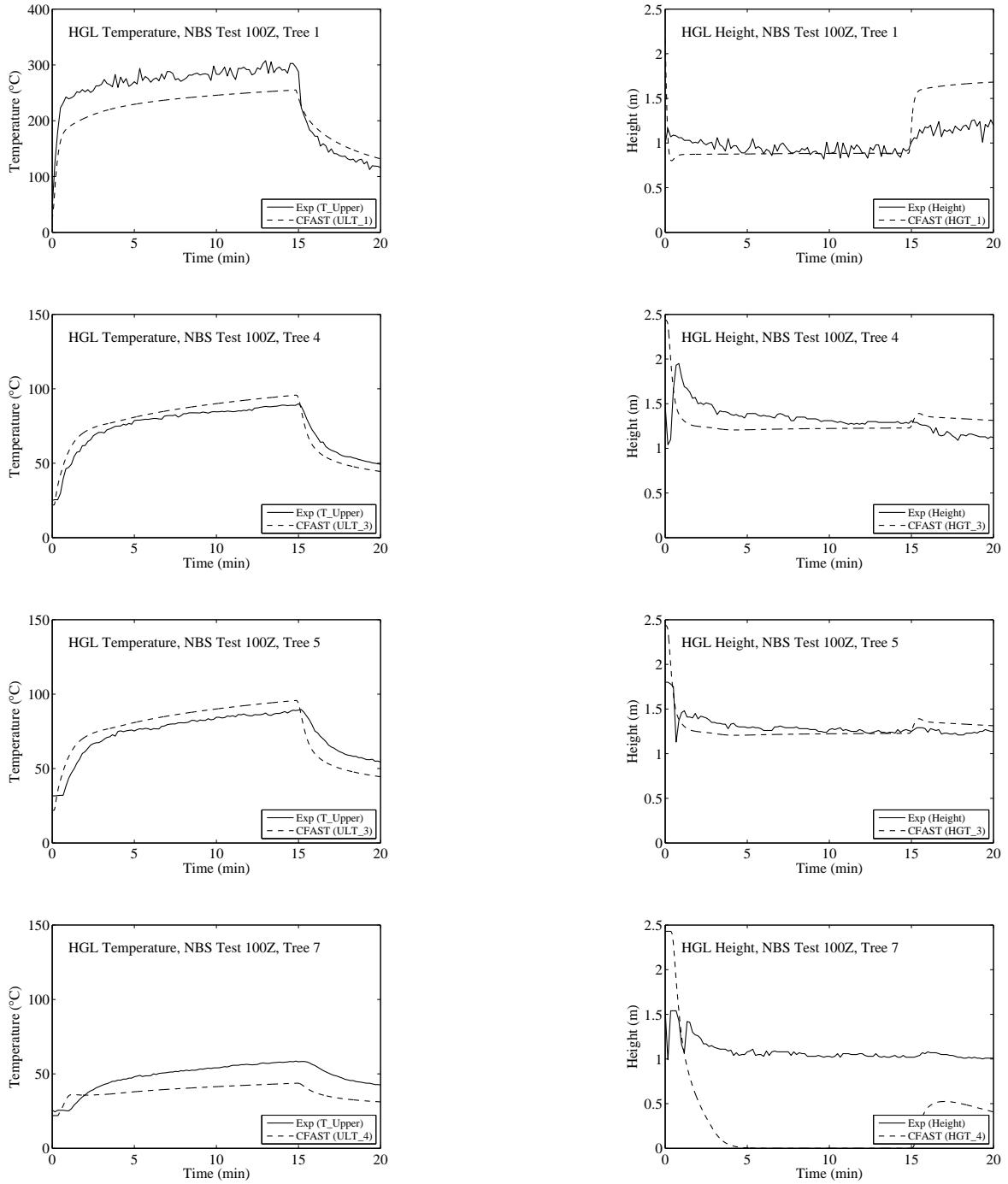
B.5 NBS Multi-Compartment Test Series



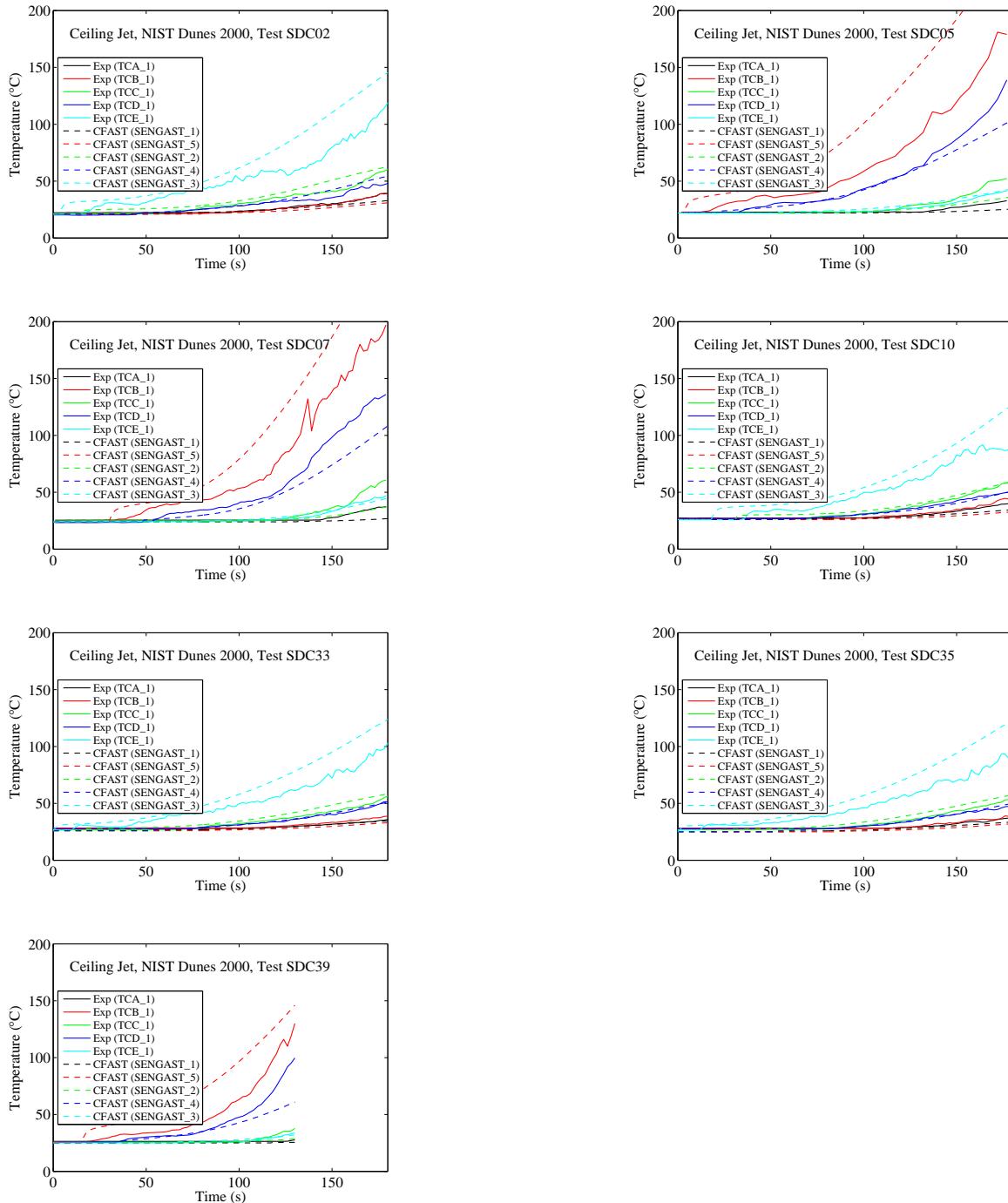
NBS MULTI-COMPARTMENT TEST SERIES



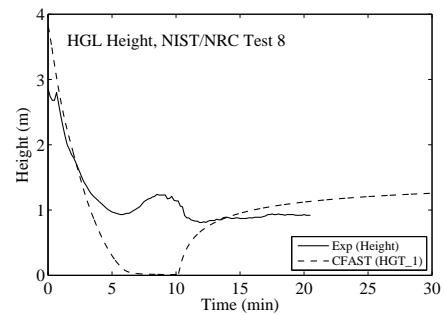
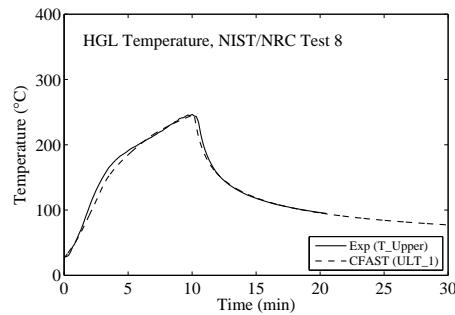
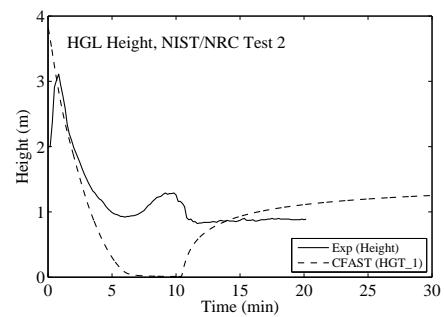
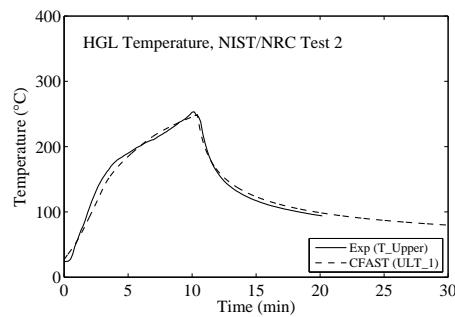
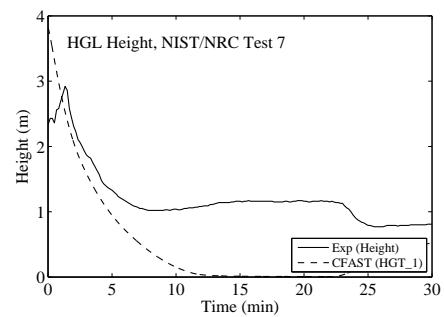
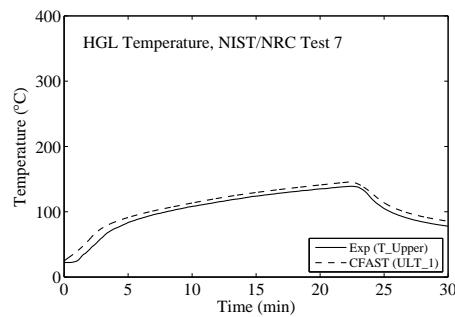
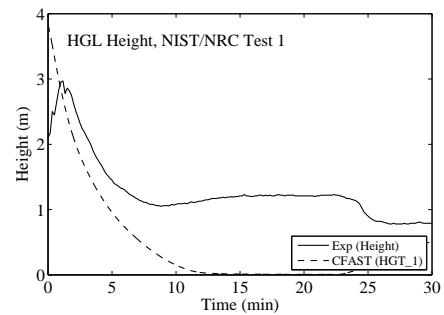
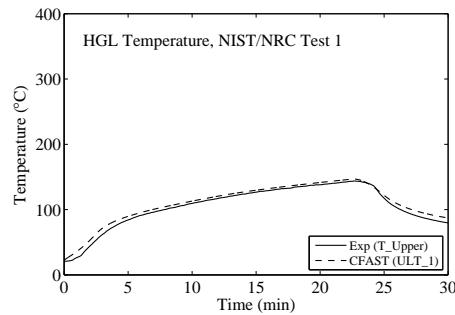
NBS MULTI-COMPARTMENT TEST SERIES

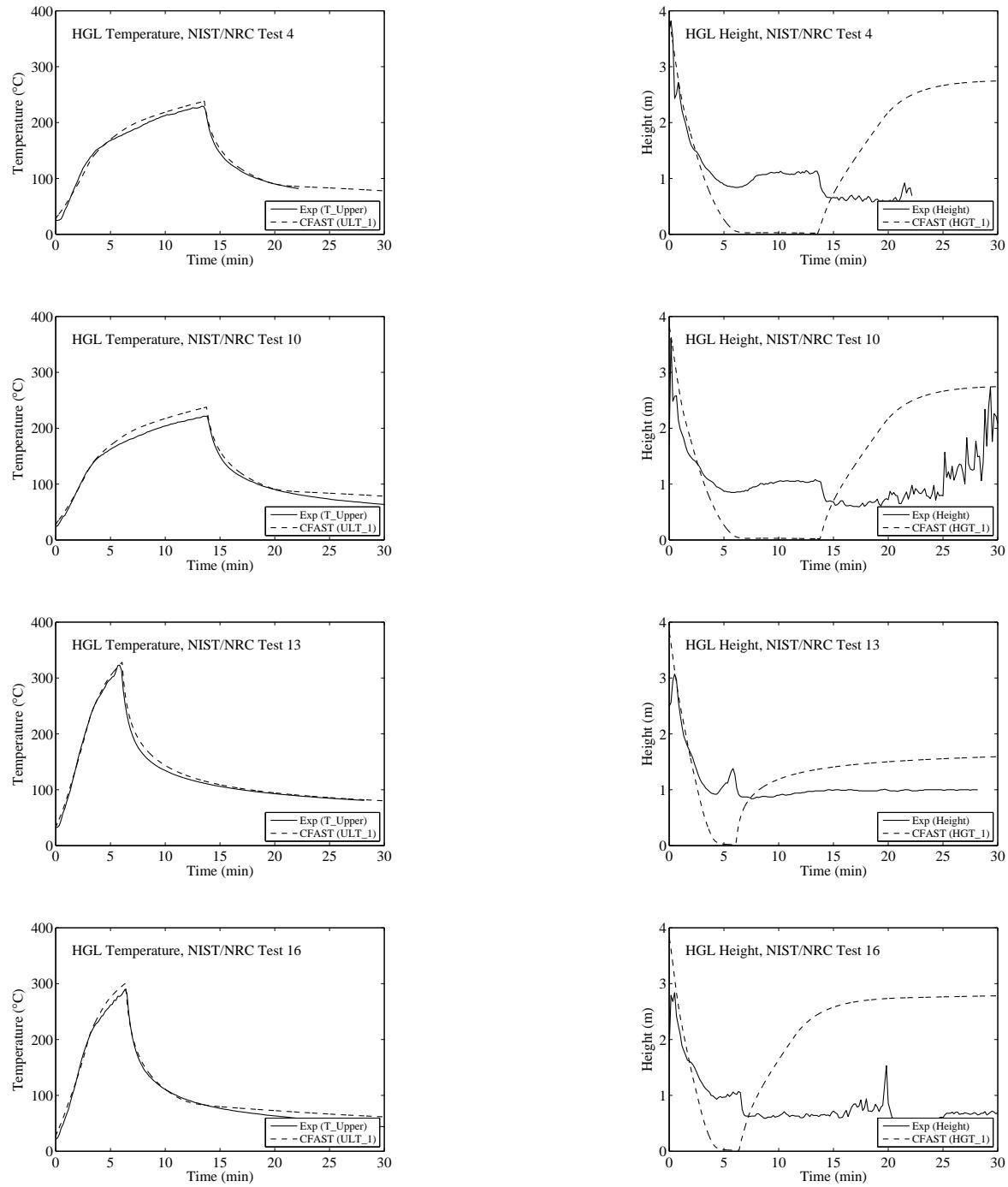


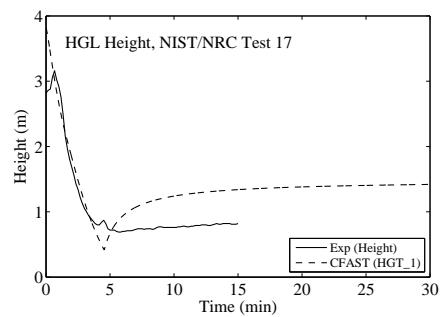
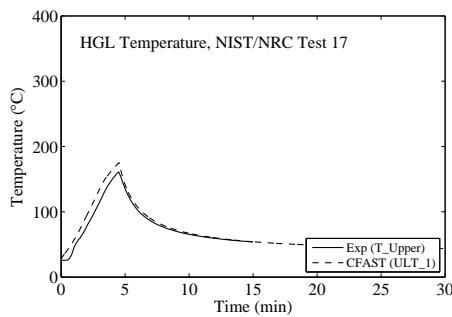
B.6 NIST Smoke Alarm Experiments



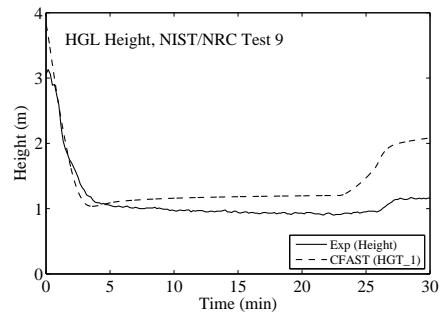
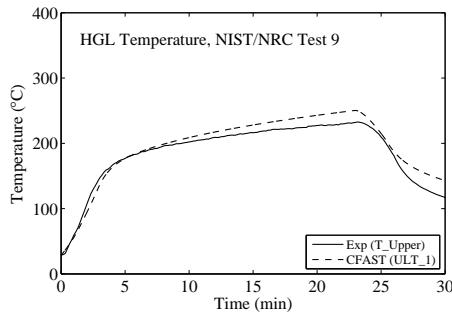
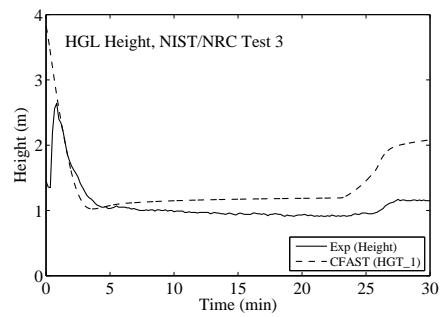
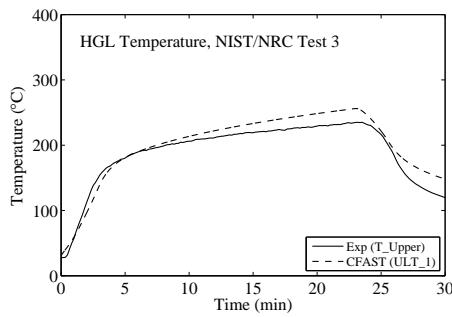
B.7 NIST/NRC Test Series

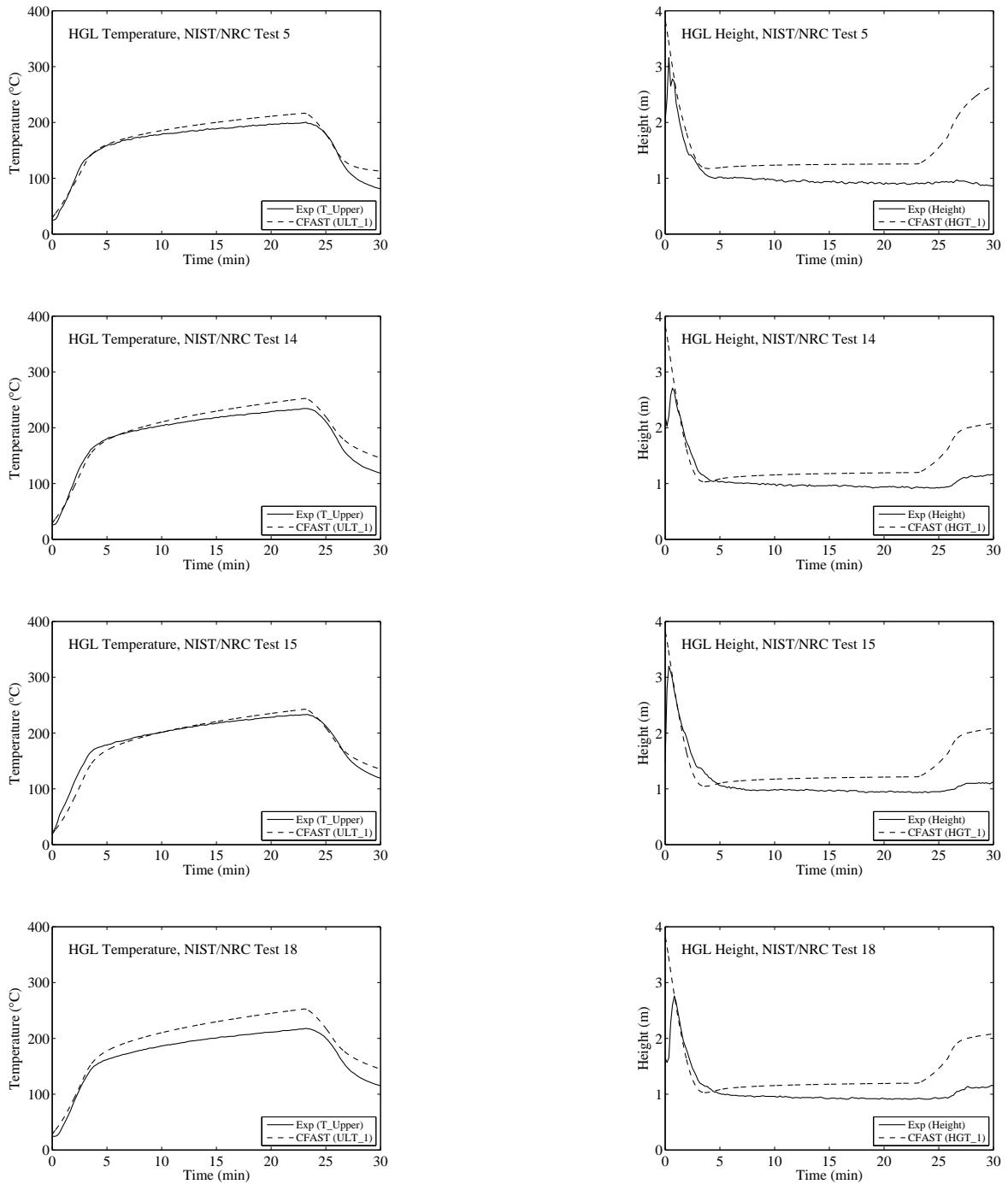


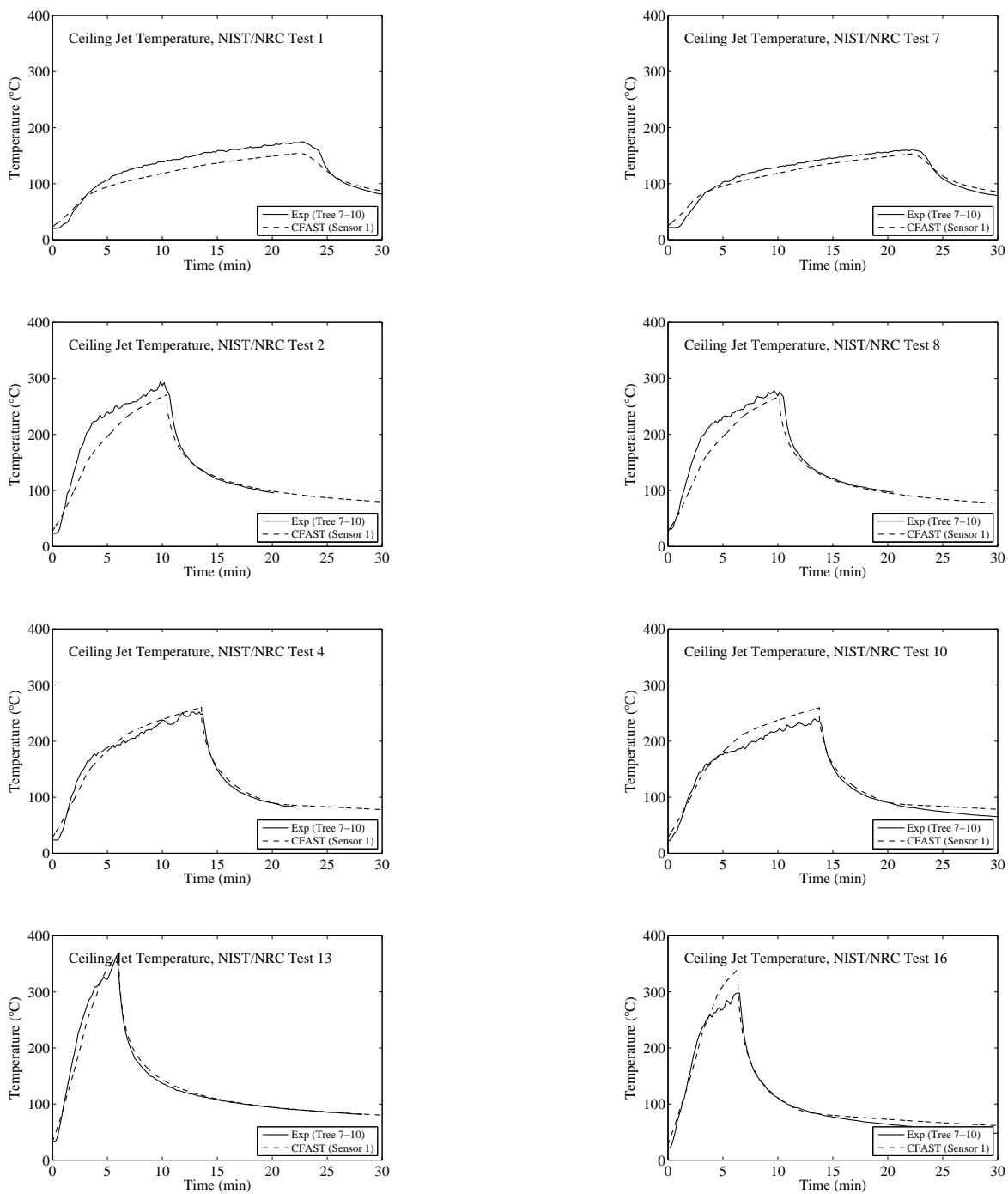


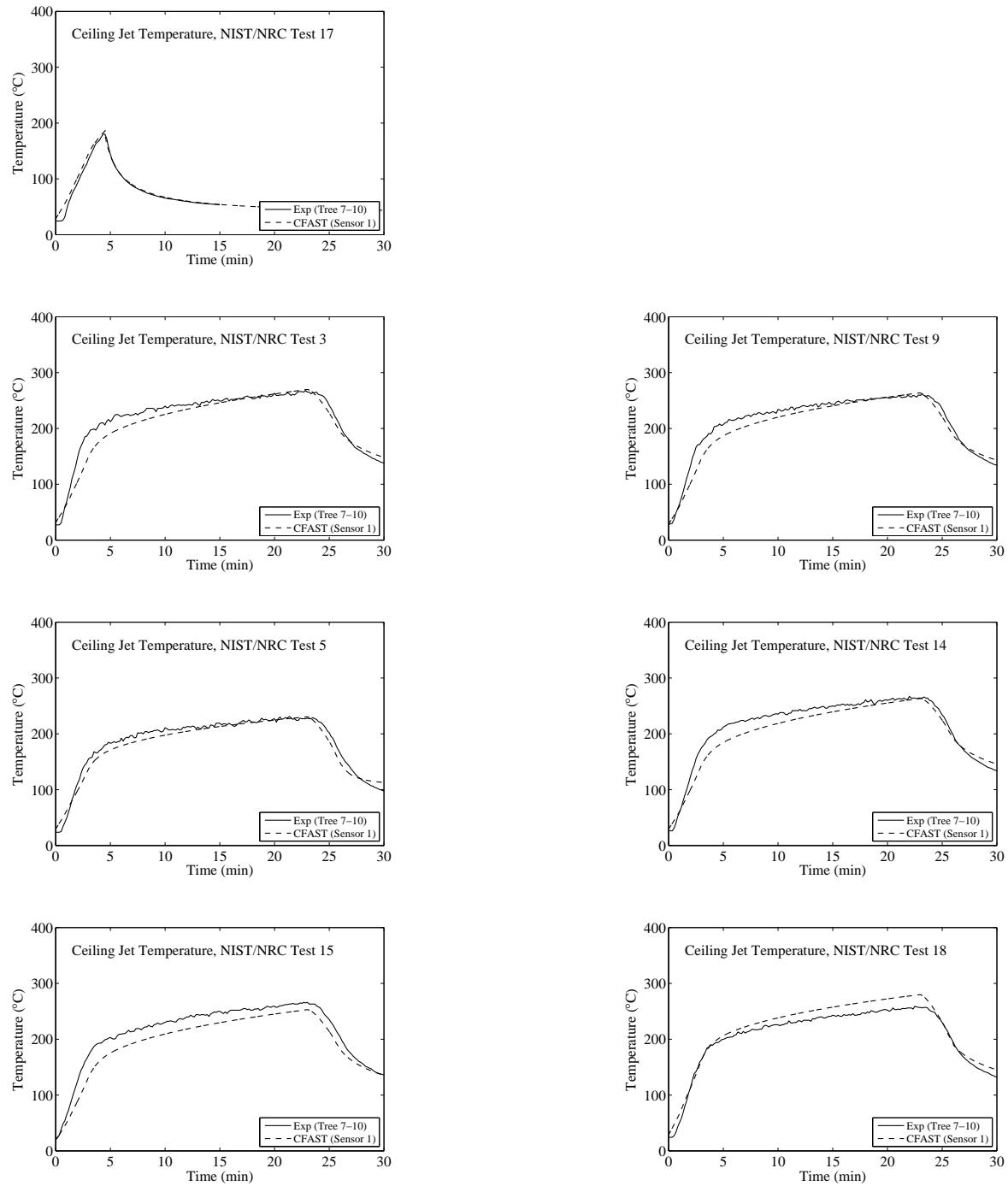


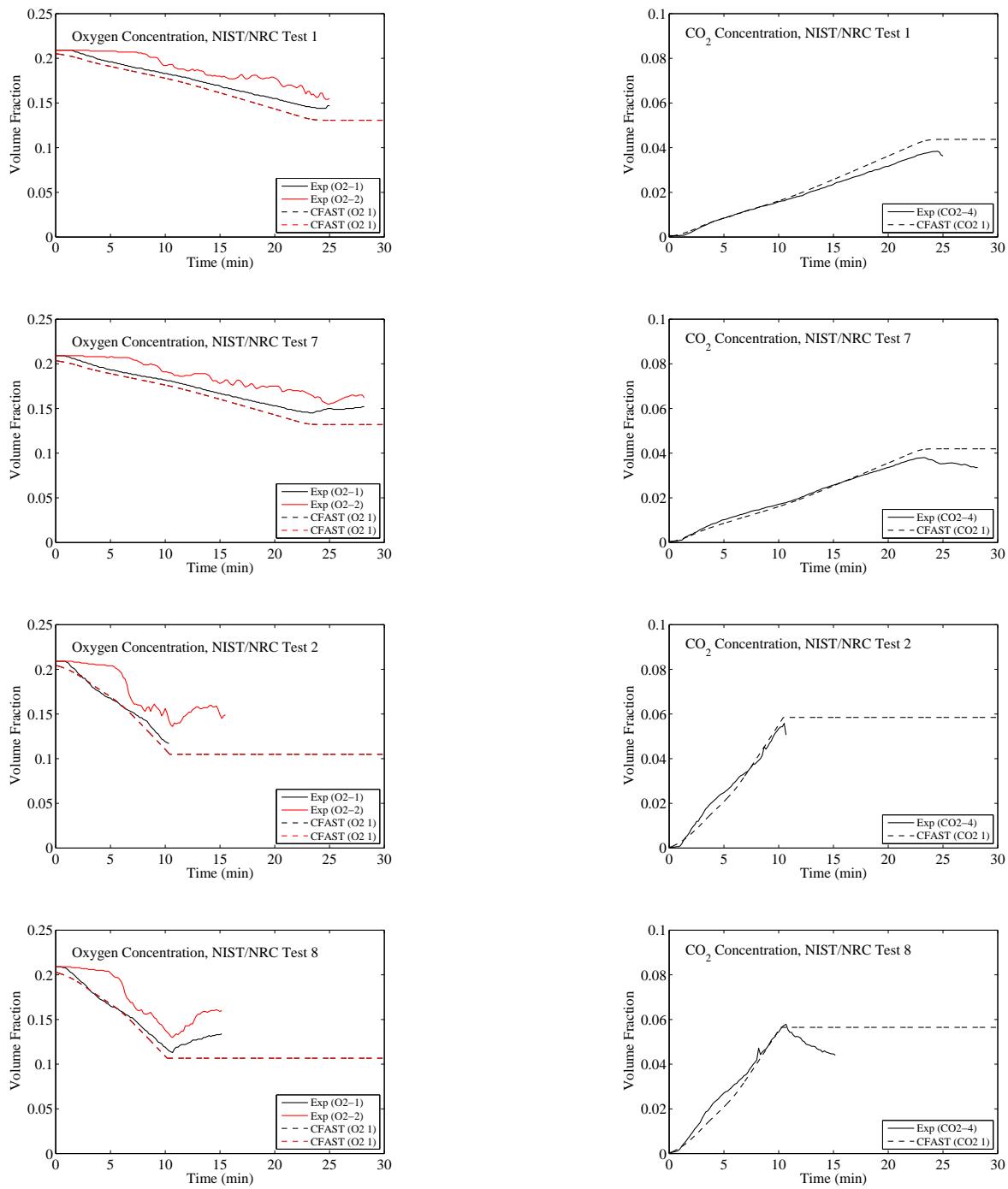
Open Door Tests to follow

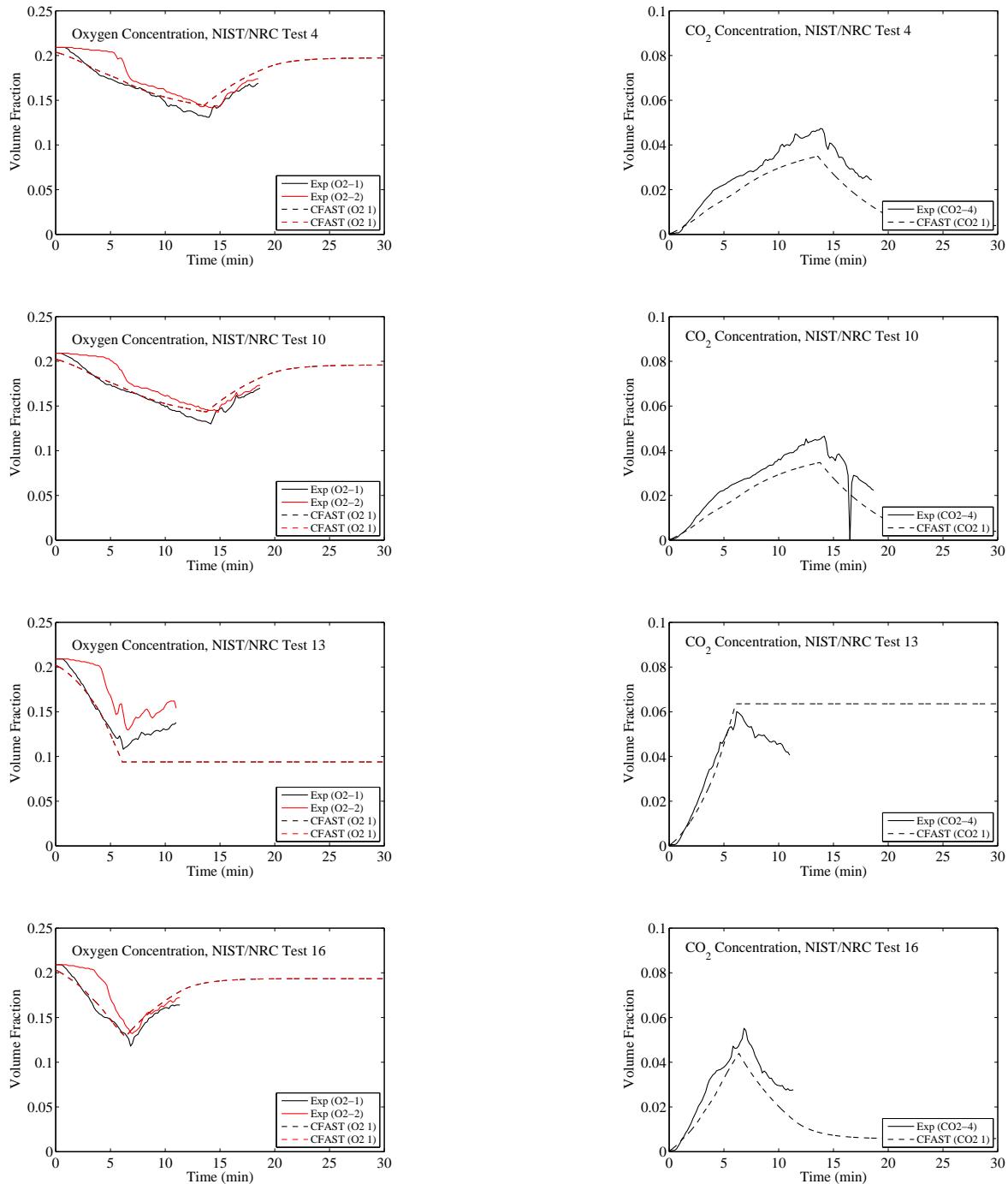


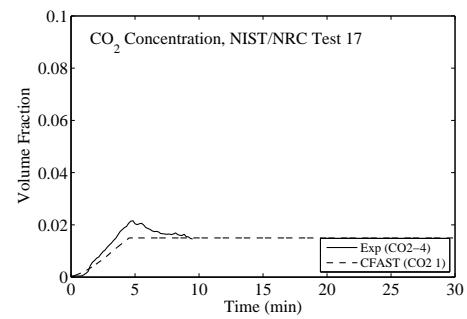
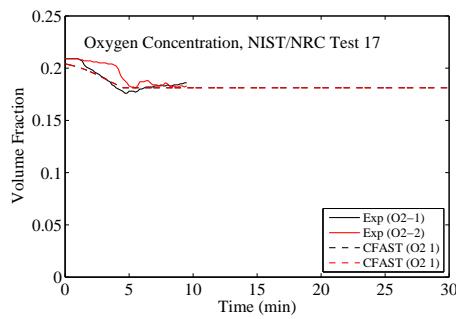




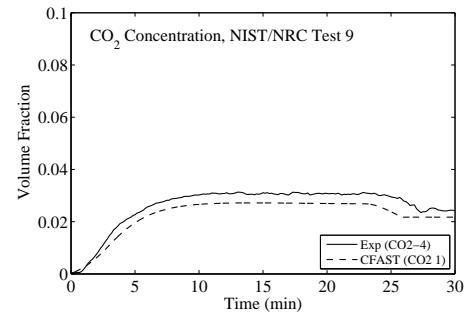
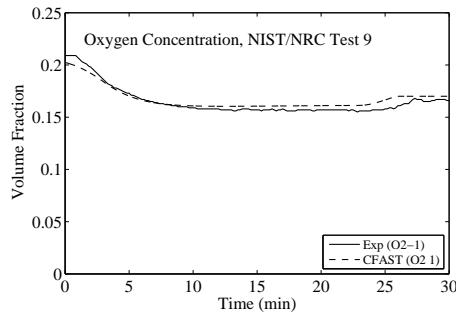
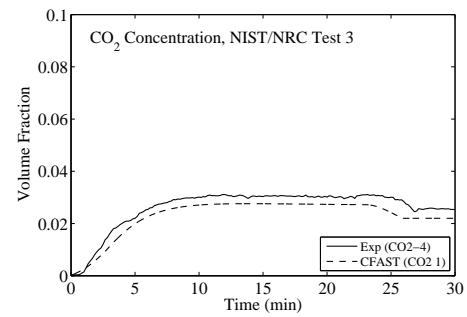
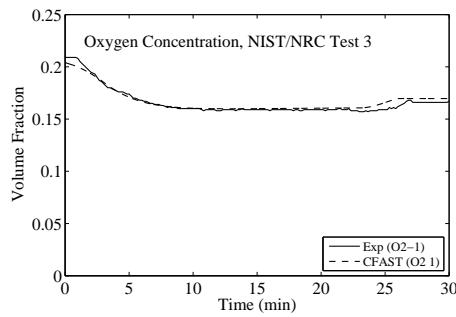


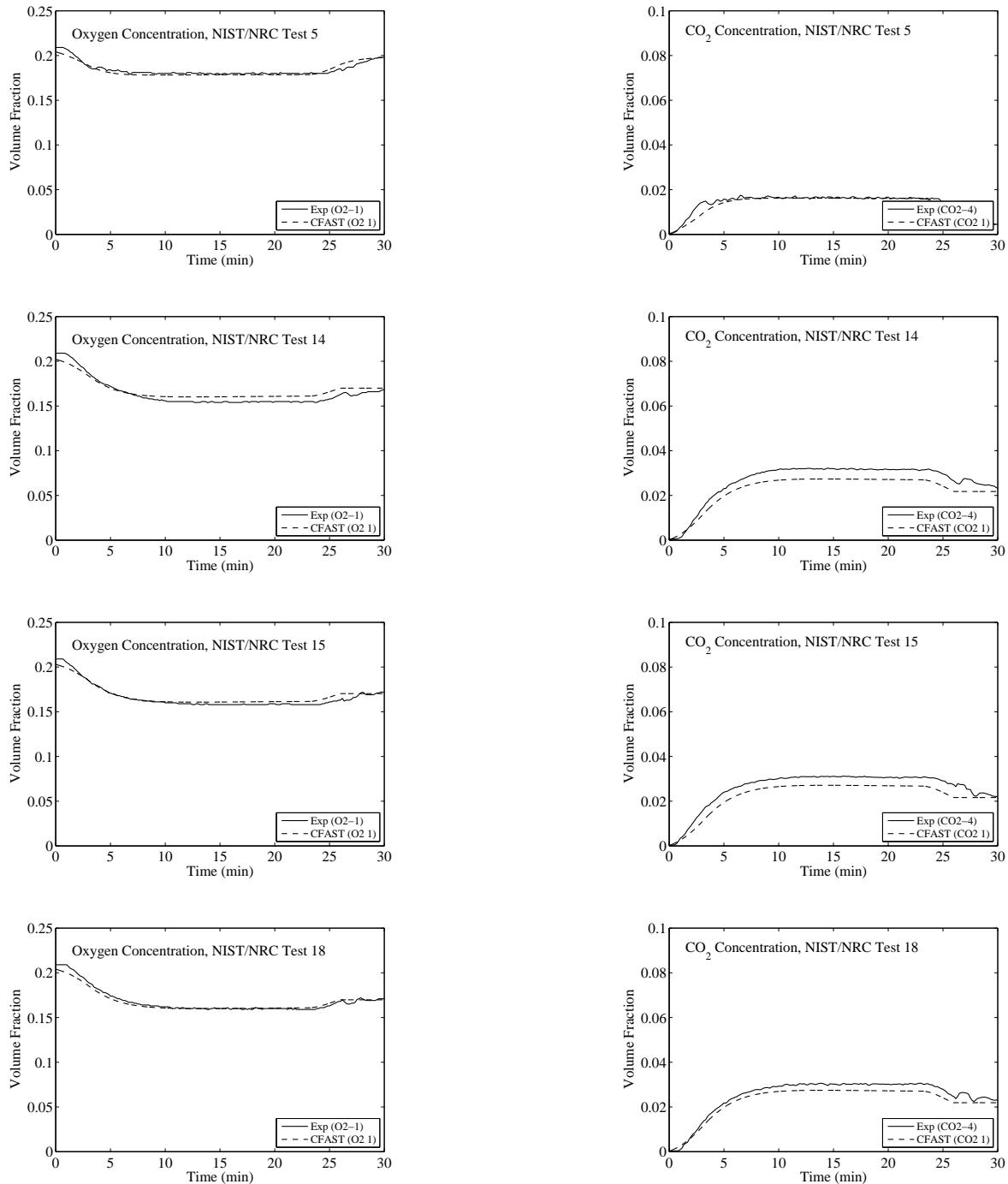




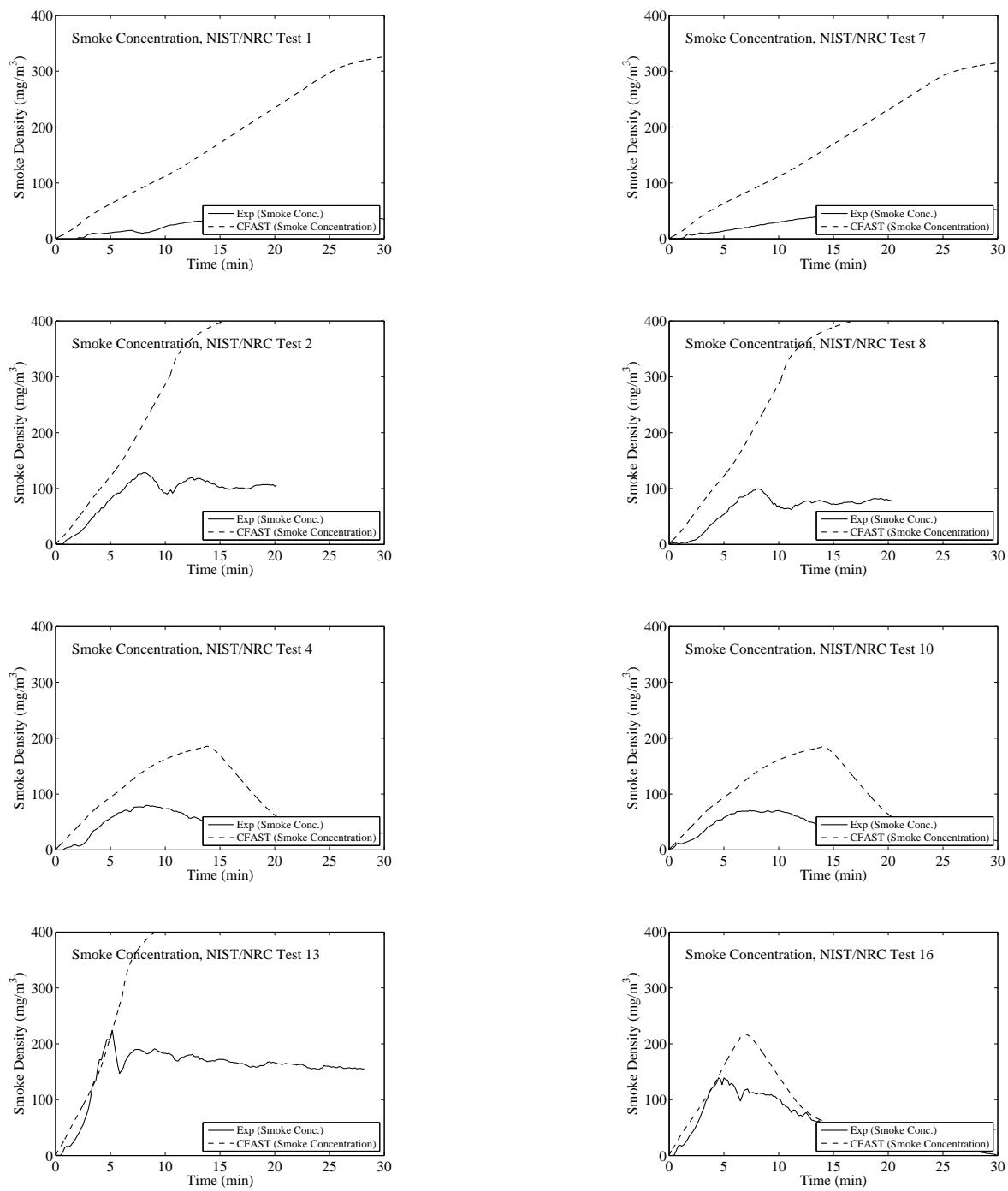


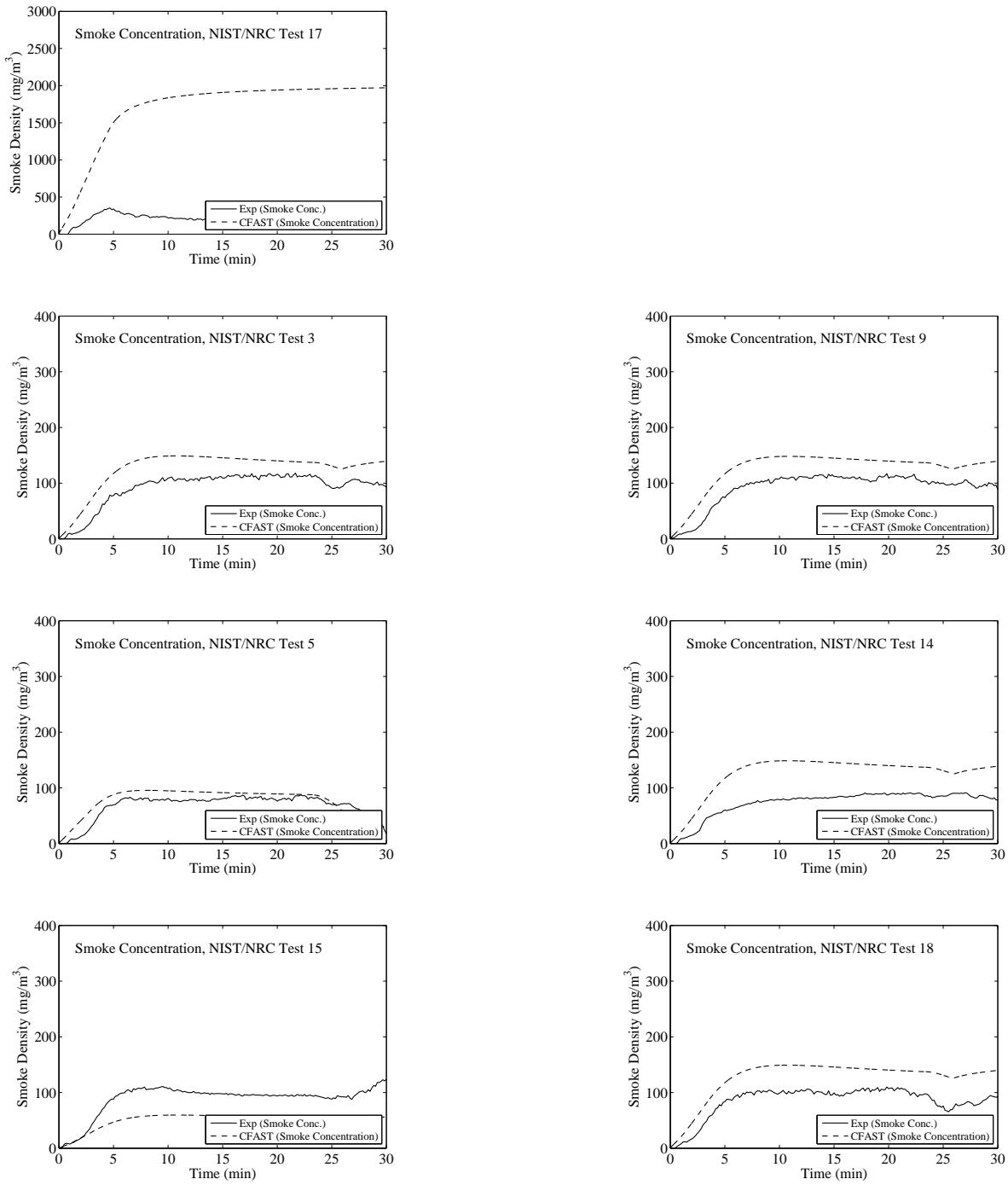
Open Door Tests to follow

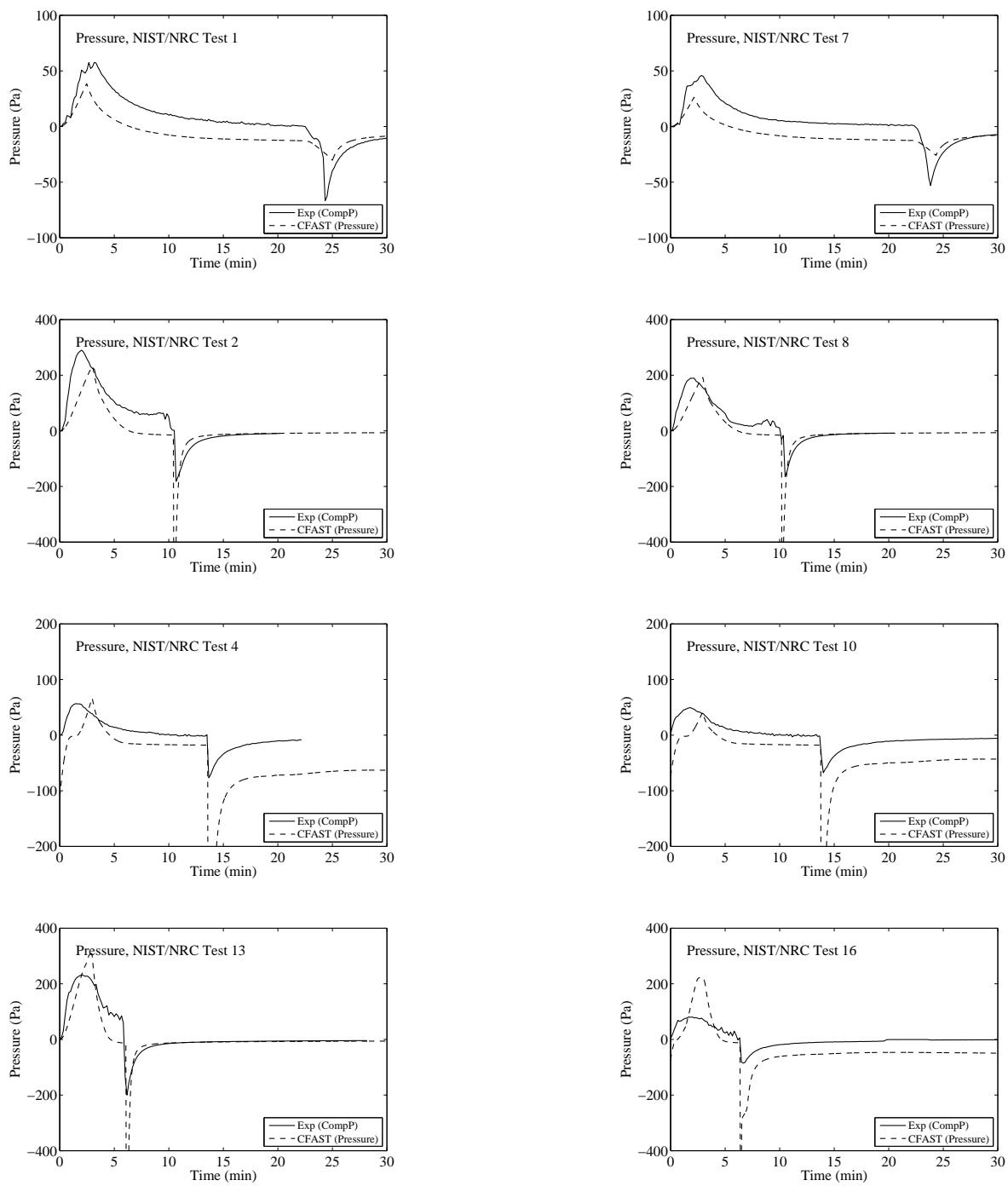


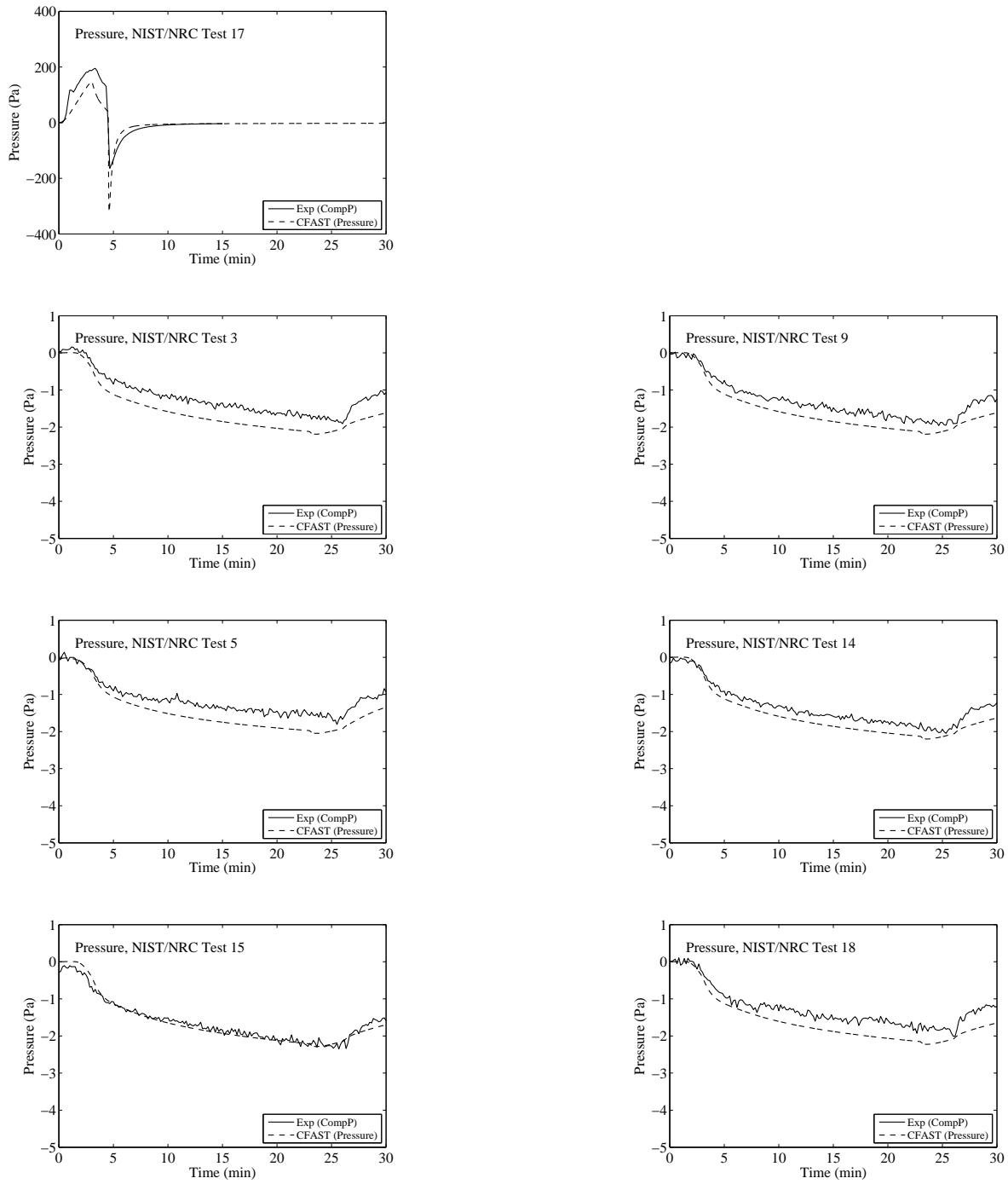


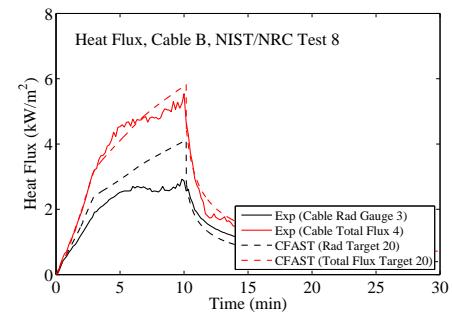
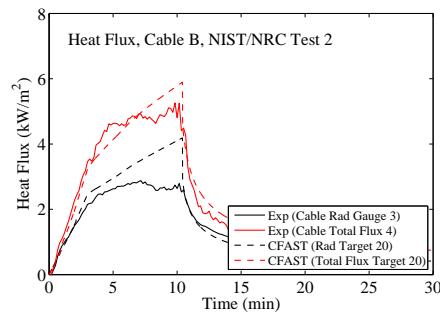
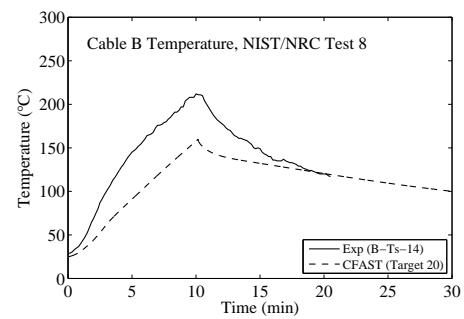
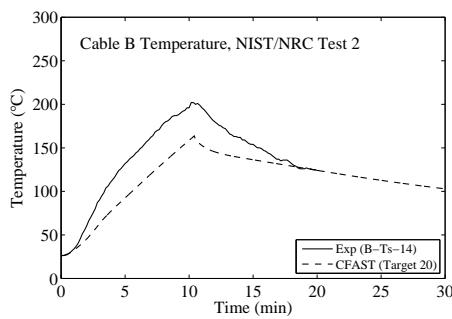
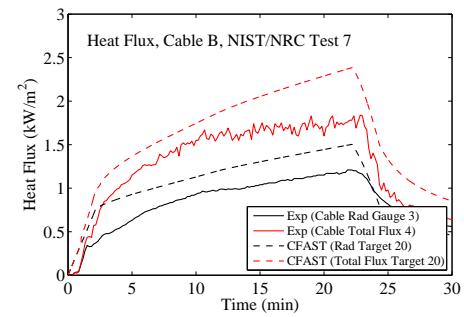
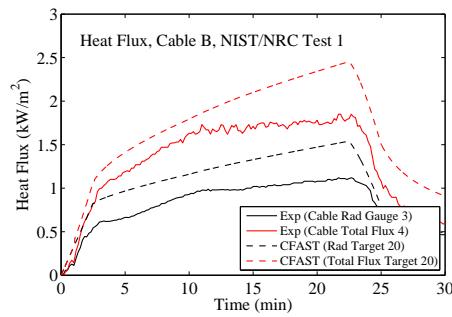
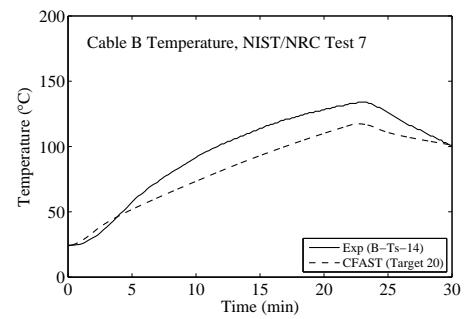
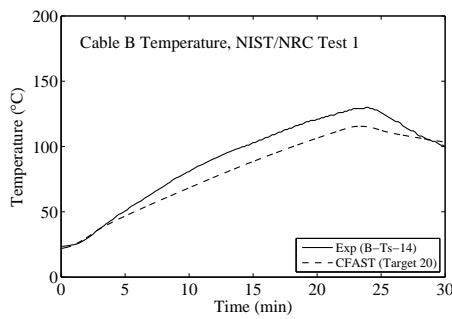
NIST/NRC TEST SERIES

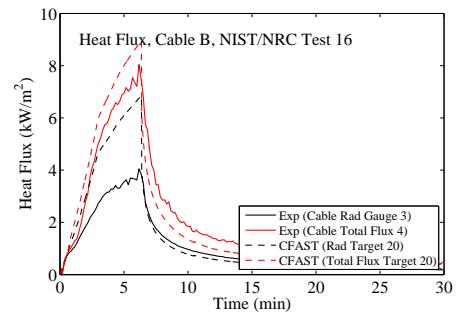
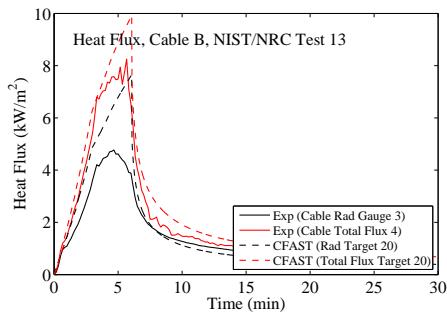
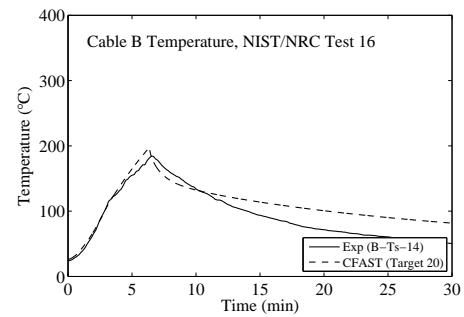
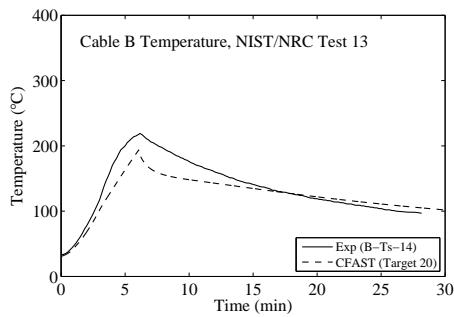
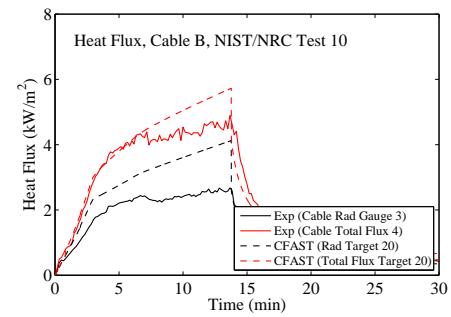
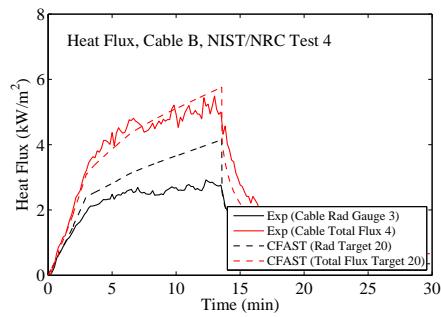
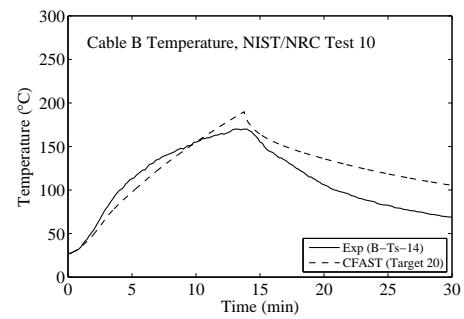
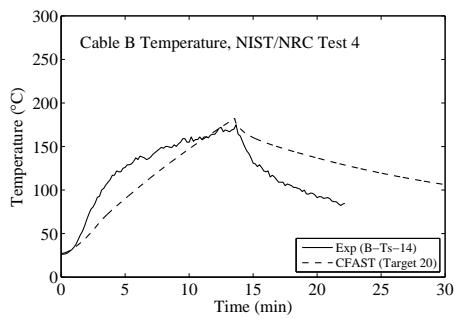


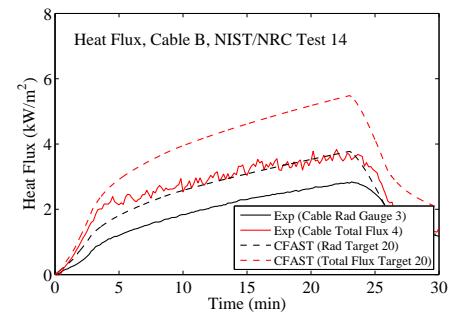
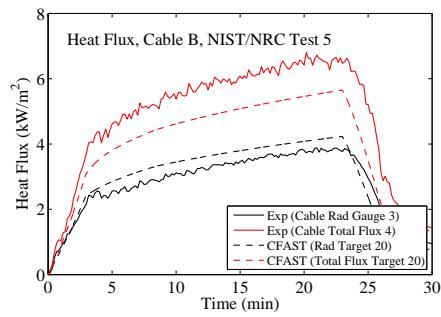
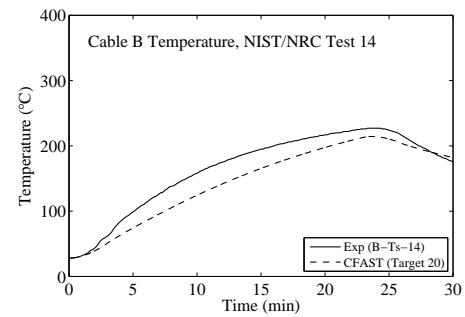
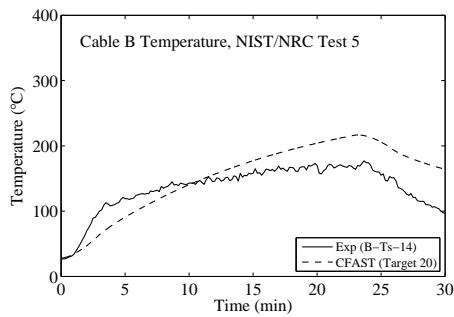
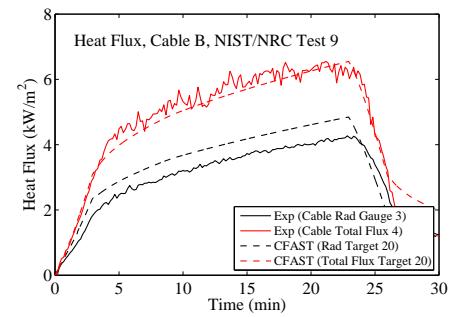
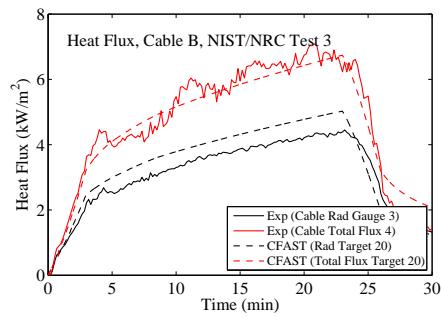
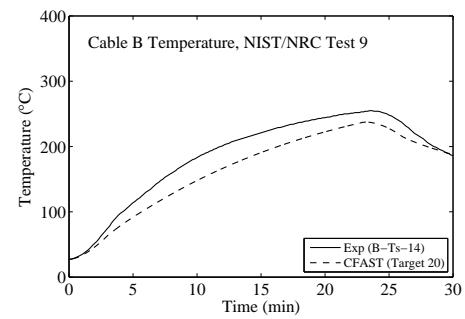
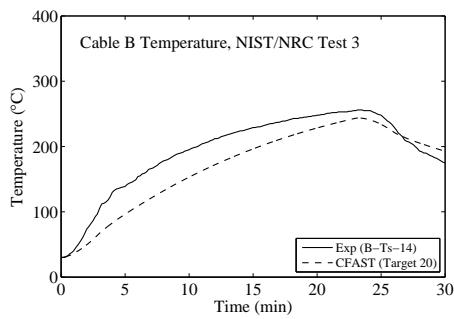


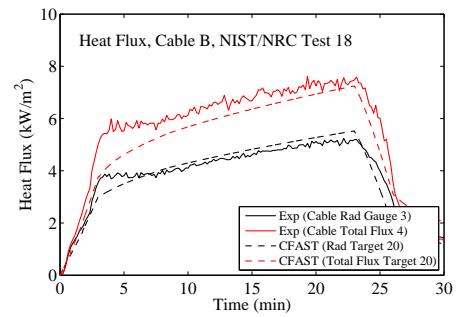
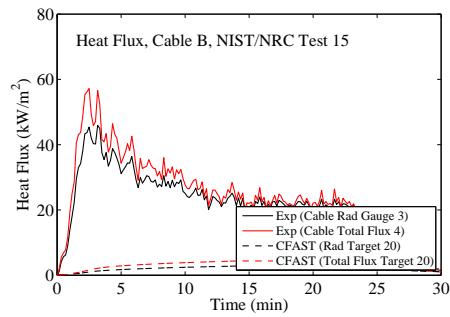
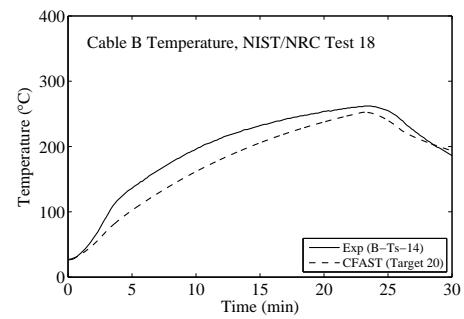
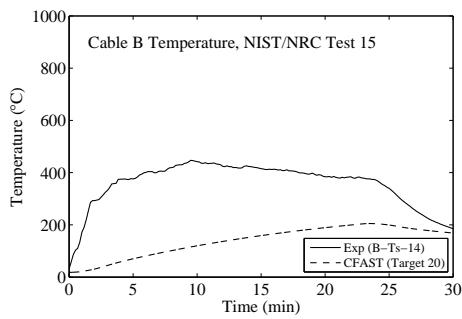


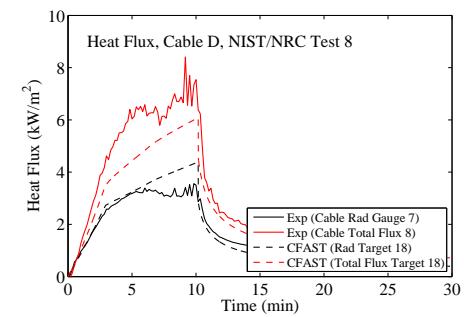
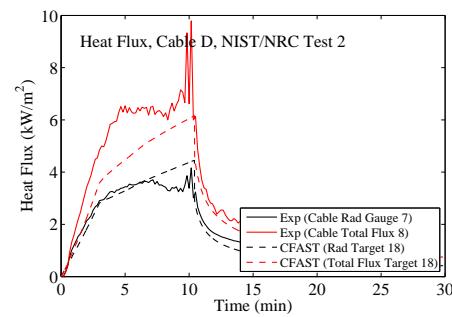
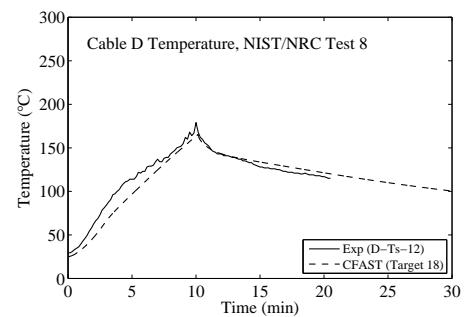
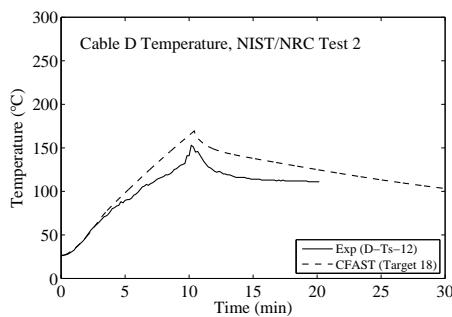
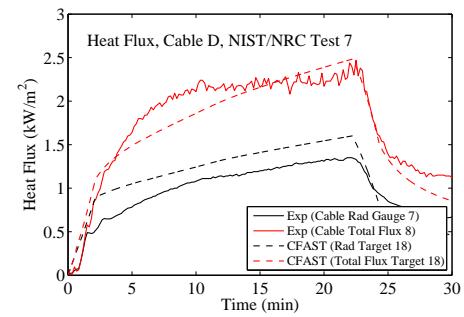
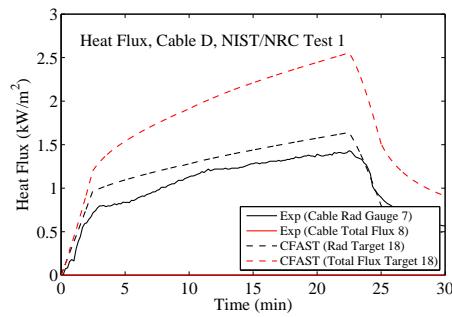
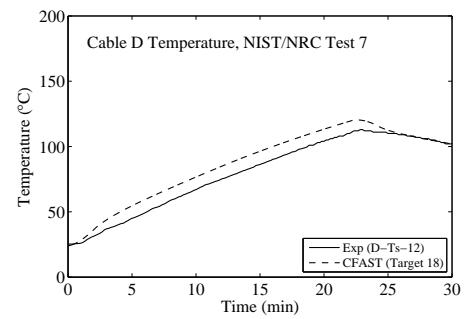
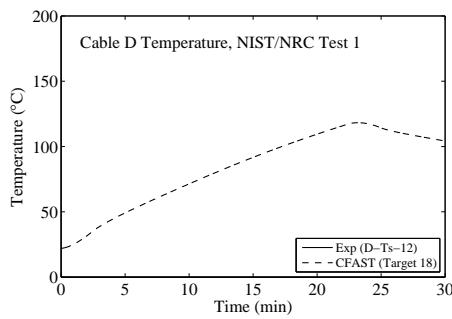


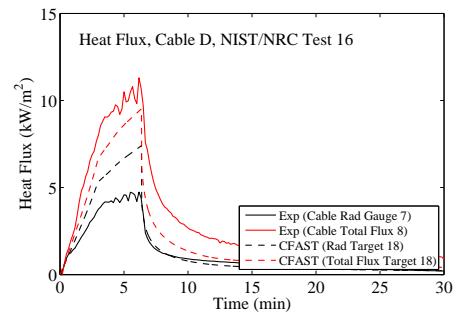
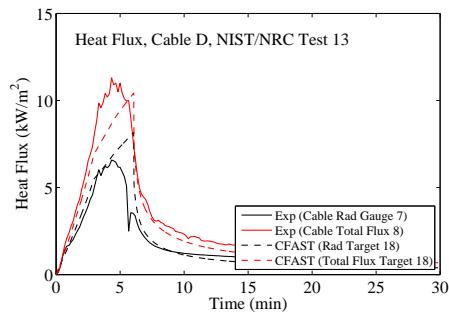
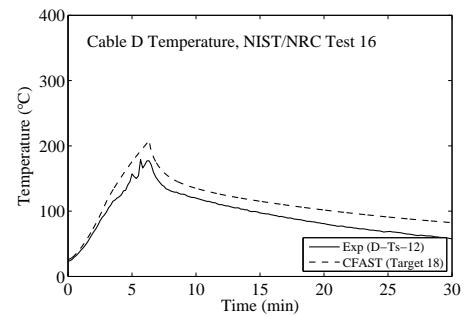
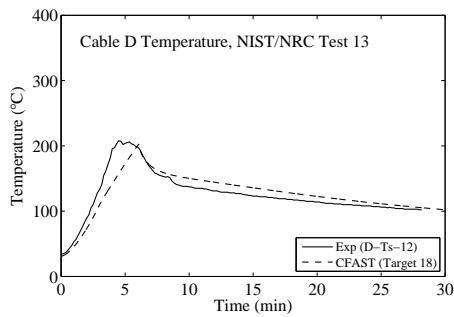
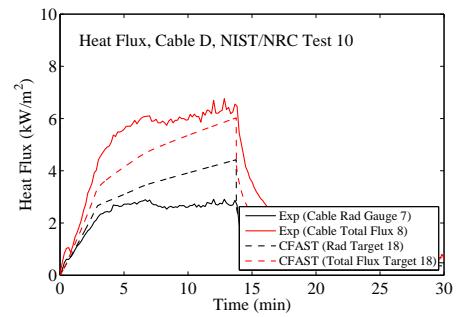
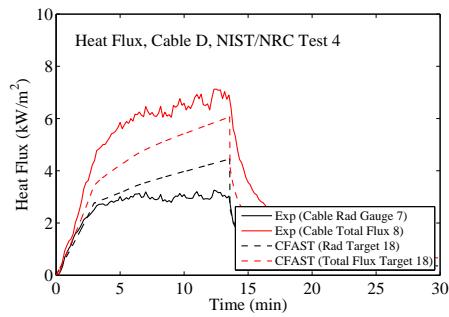
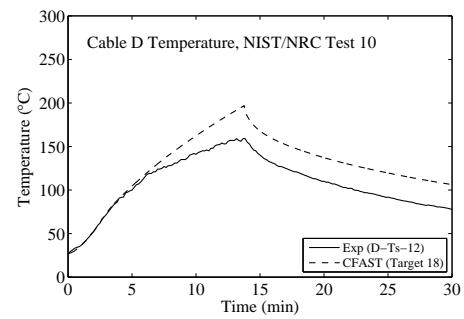
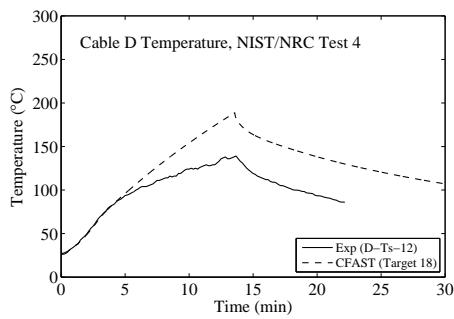


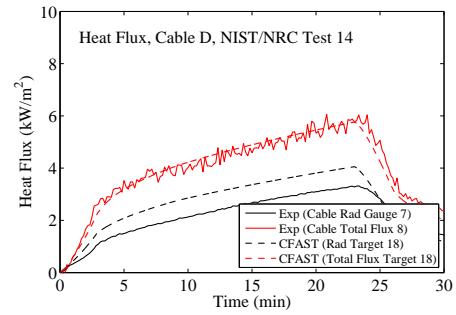
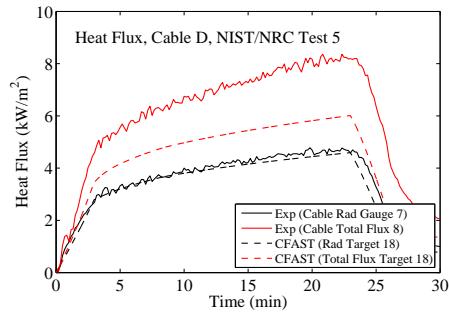
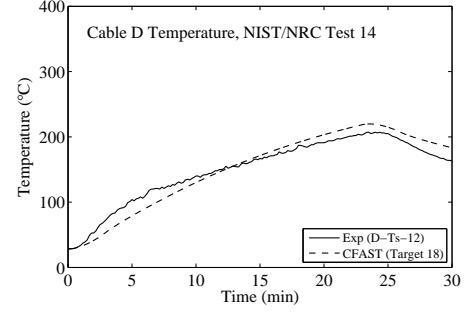
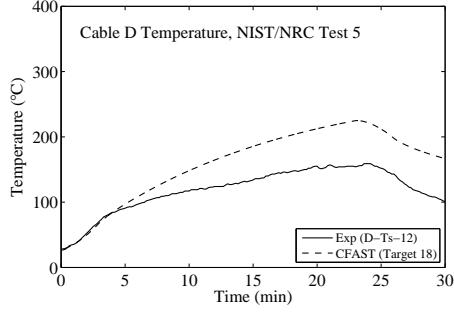
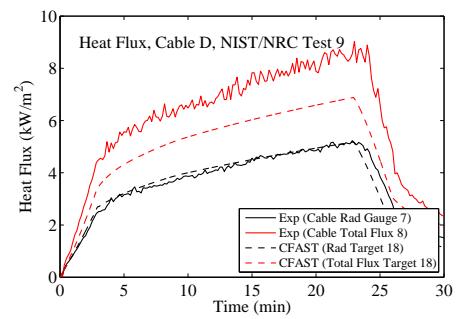
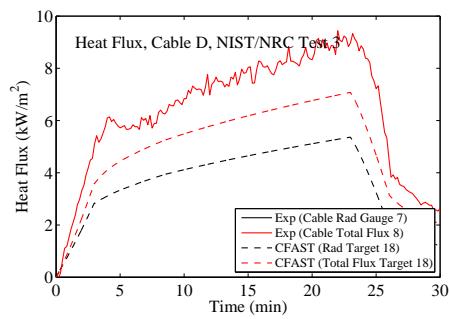
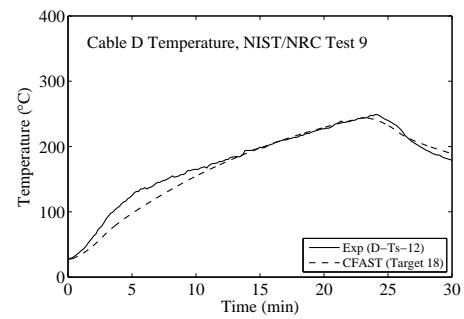
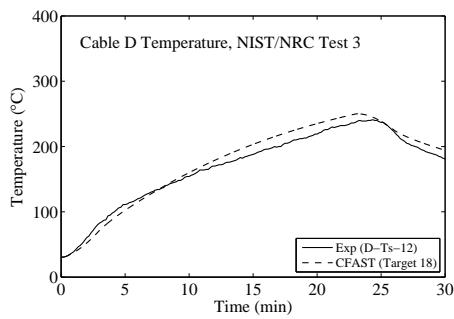


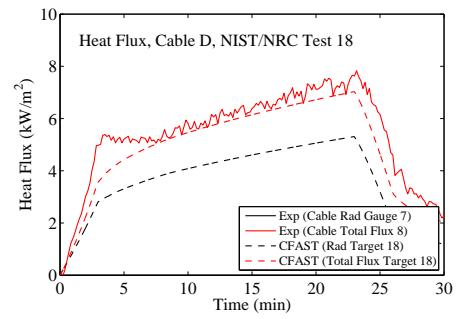
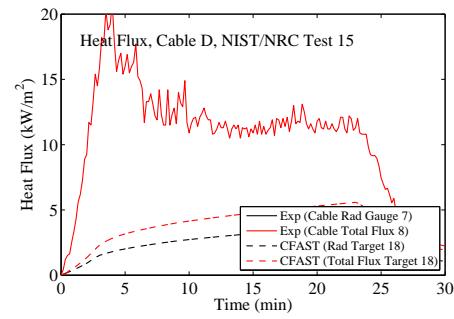
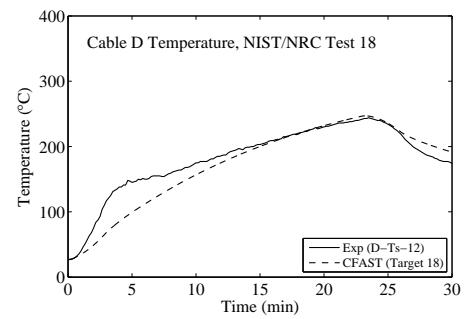
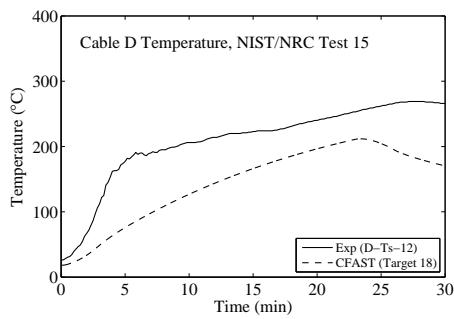


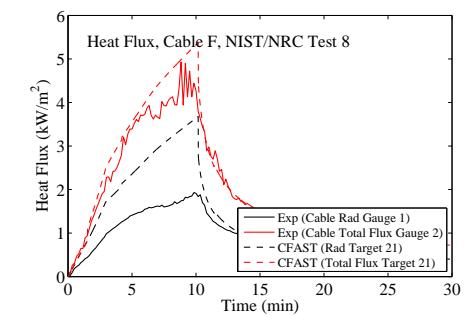
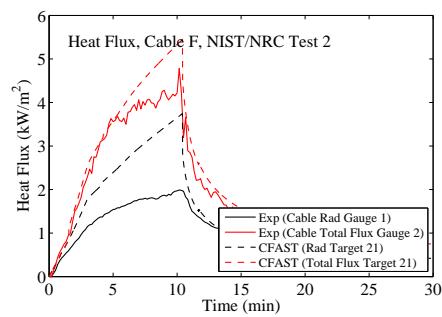
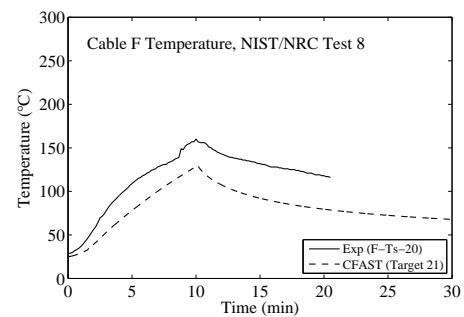
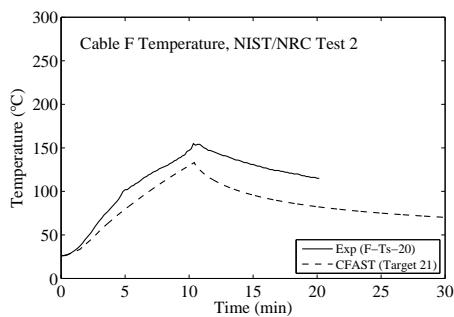
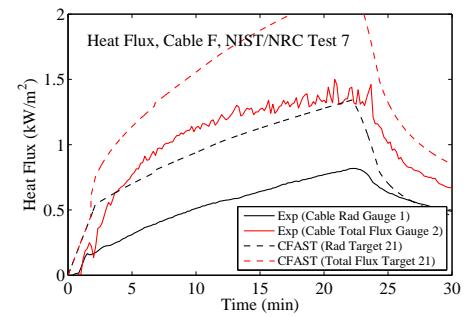
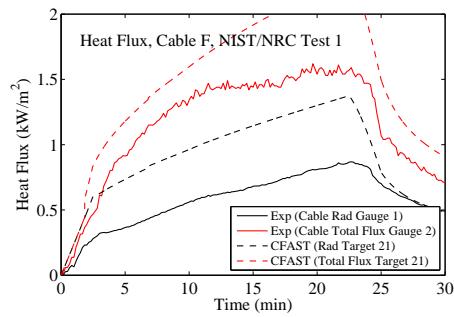
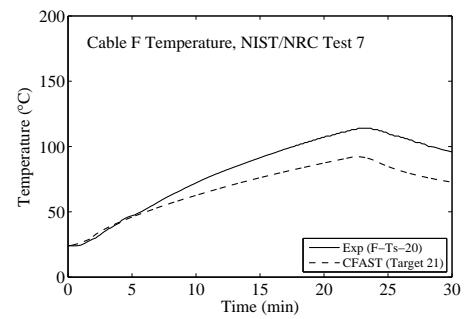
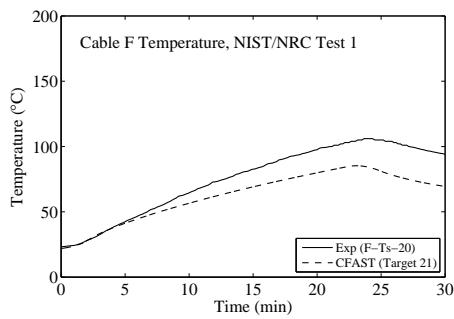


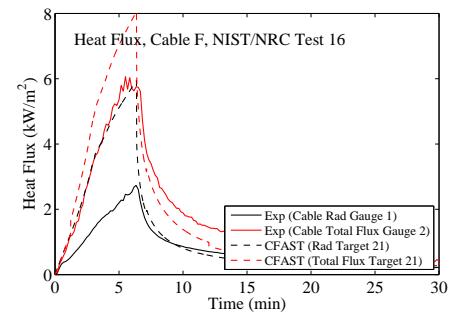
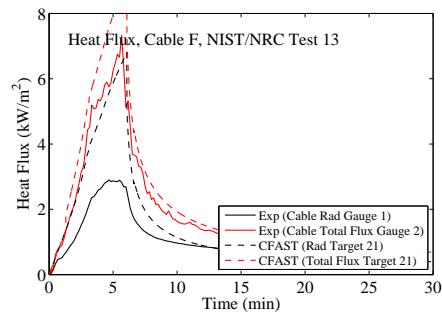
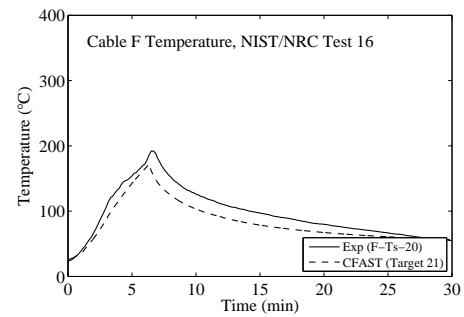
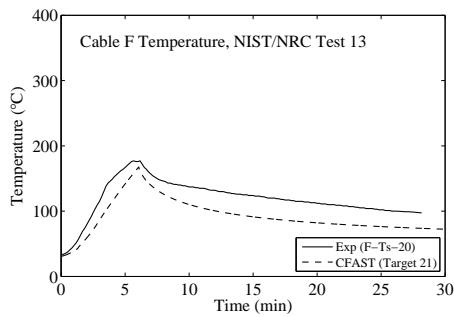
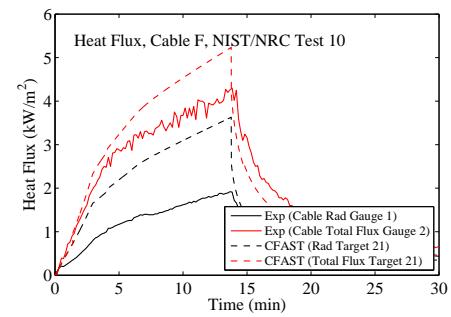
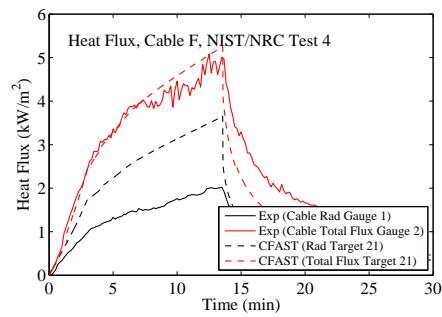
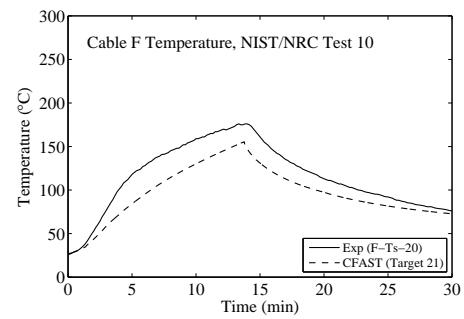
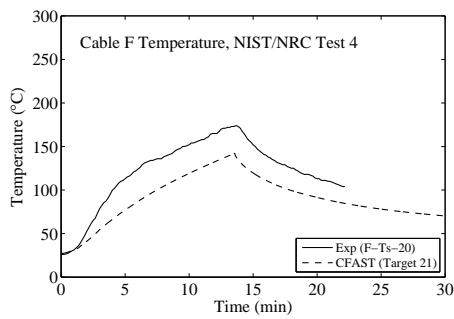


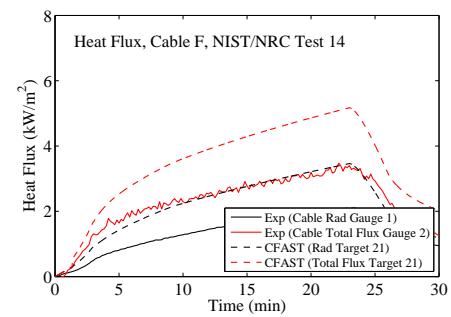
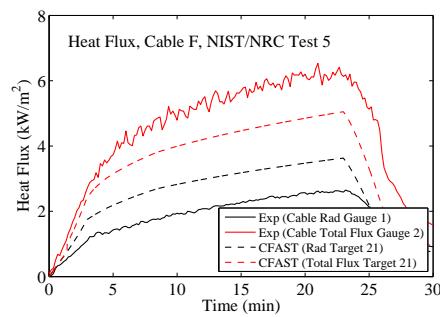
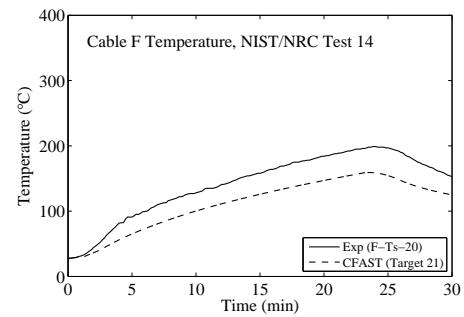
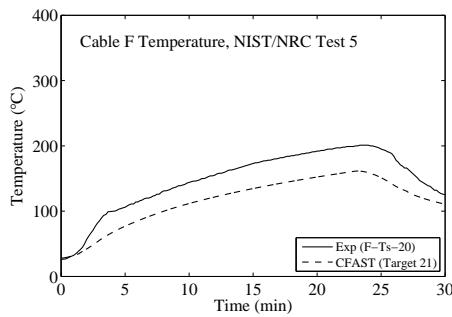
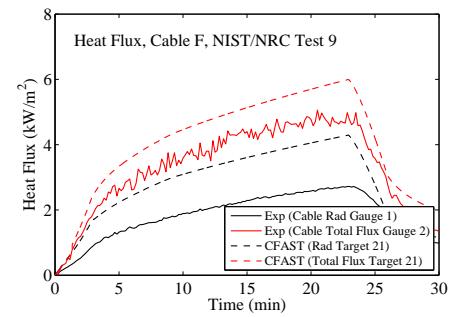
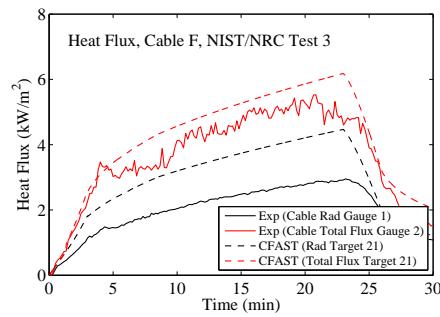
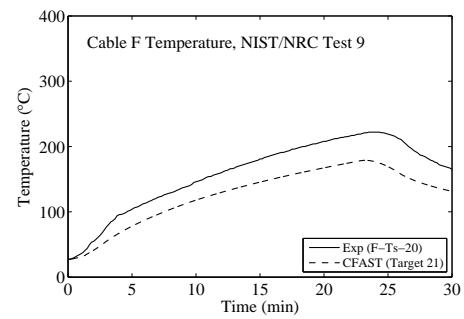
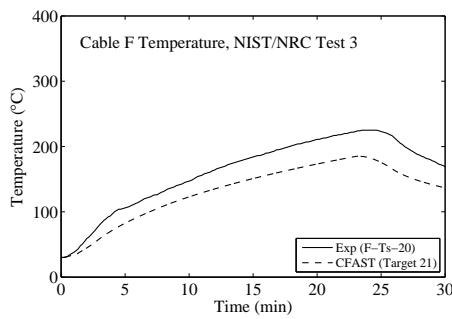


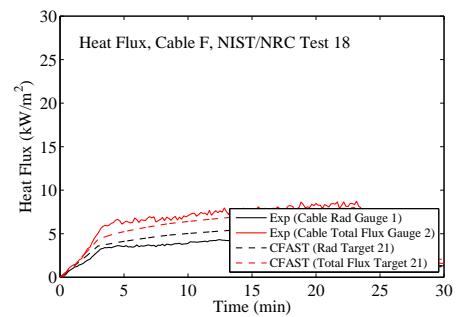
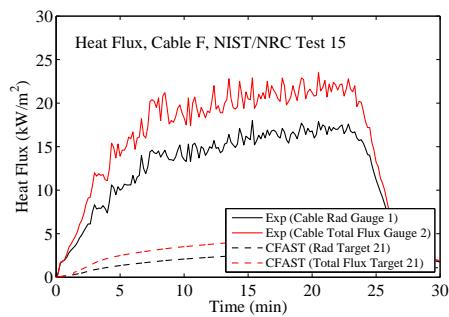
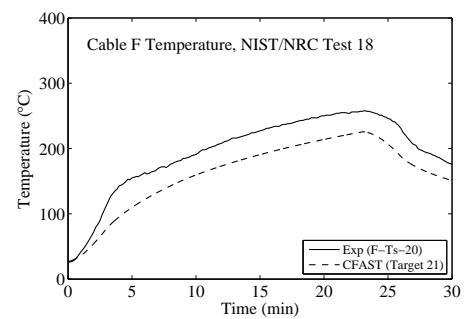
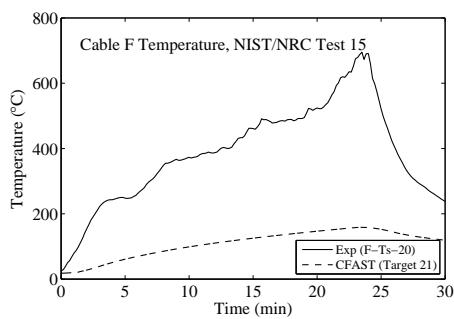


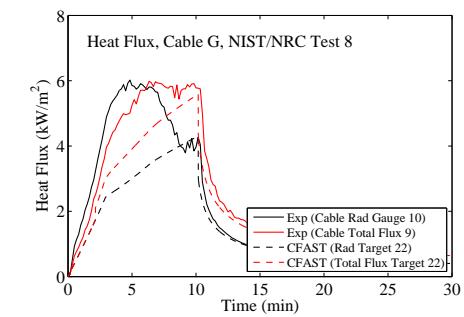
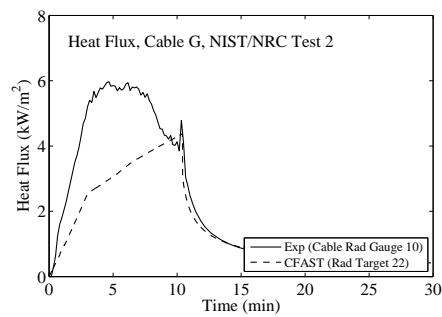
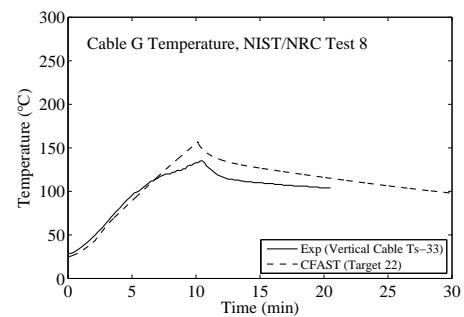
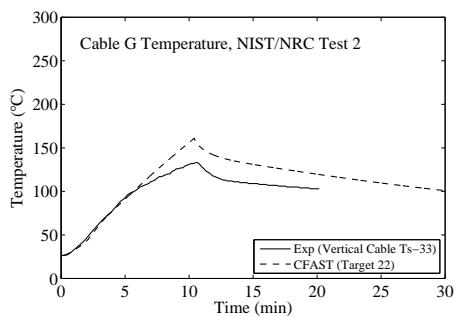
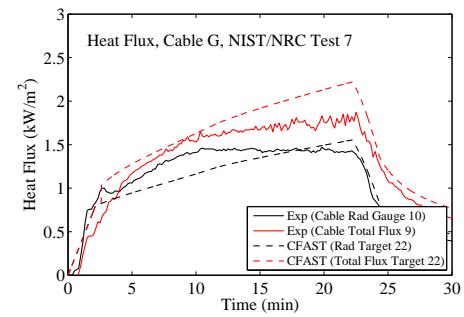
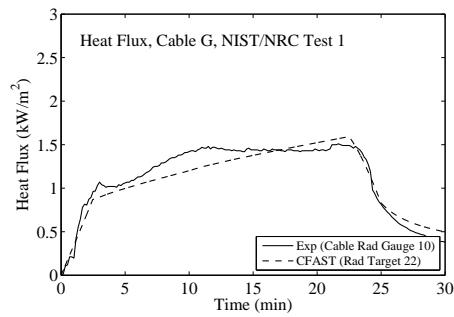
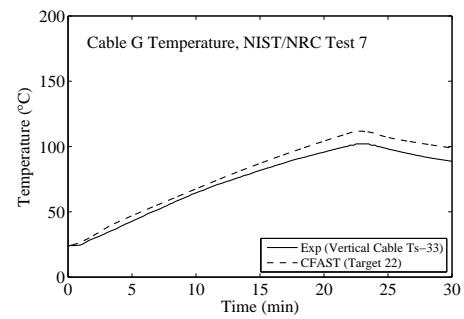
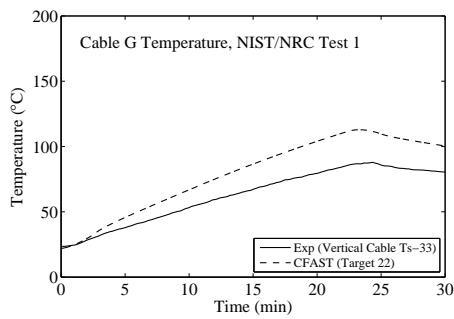


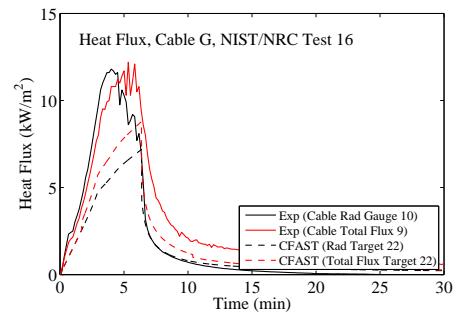
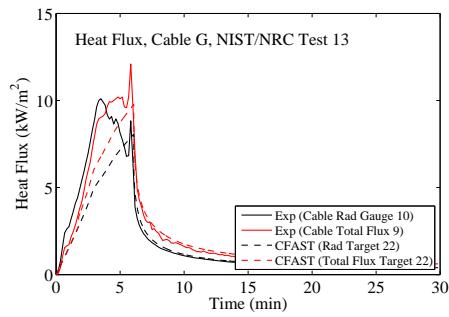
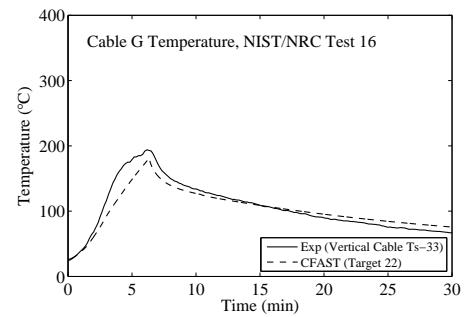
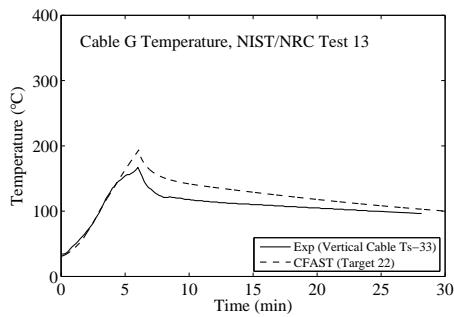
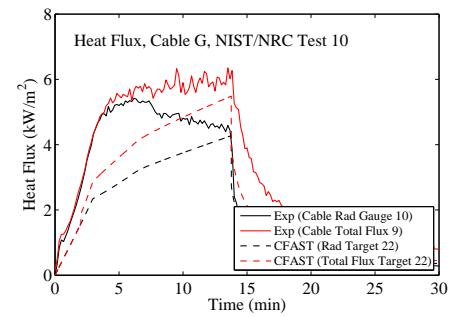
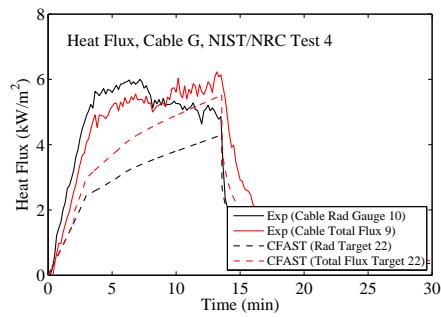
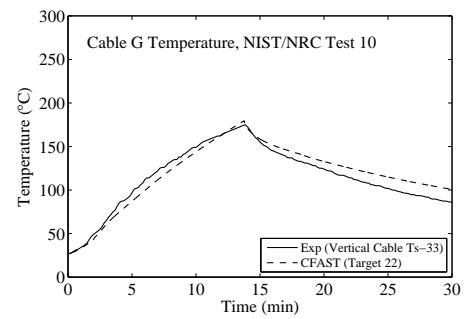
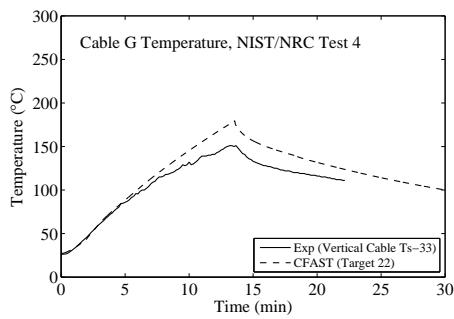


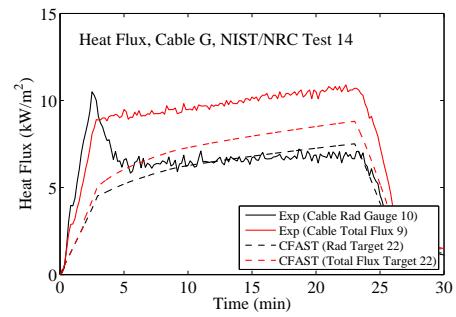
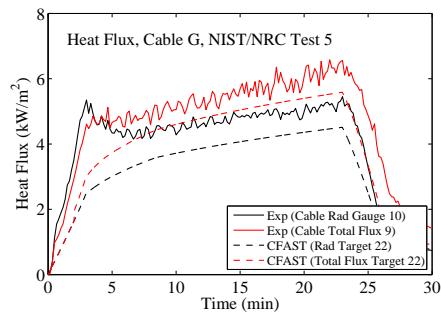
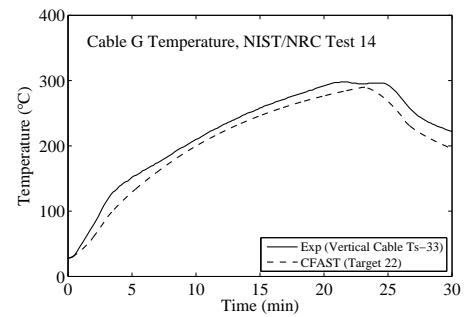
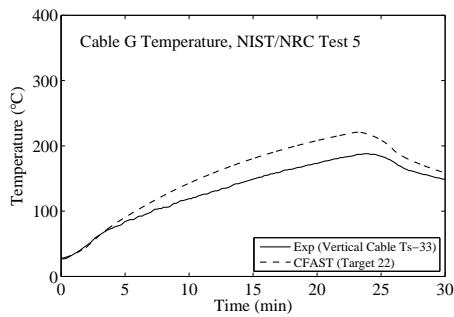
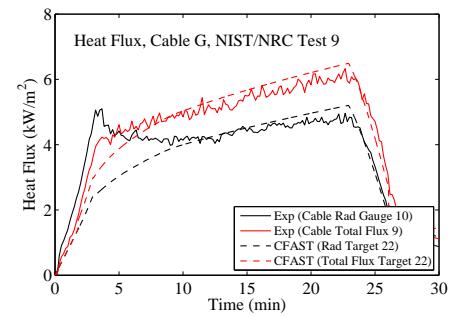
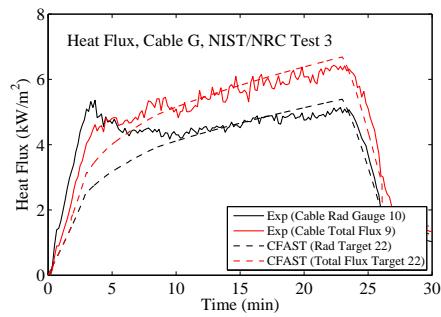
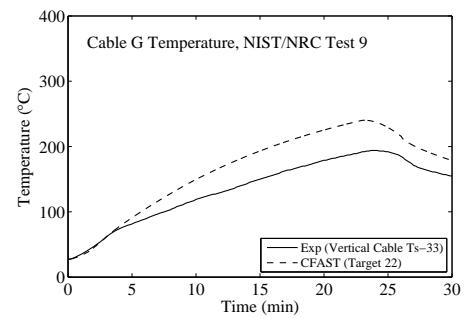
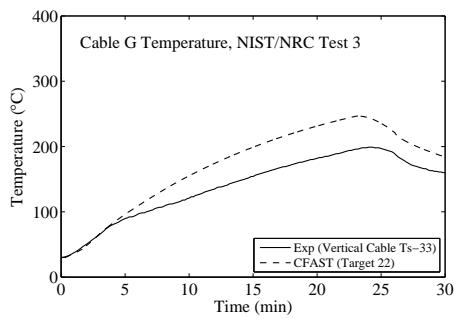


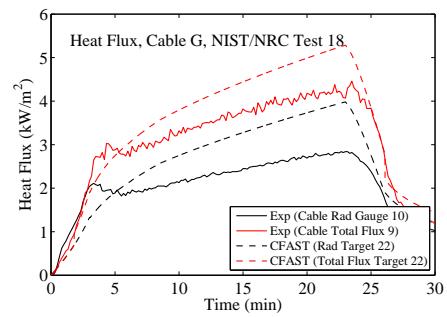
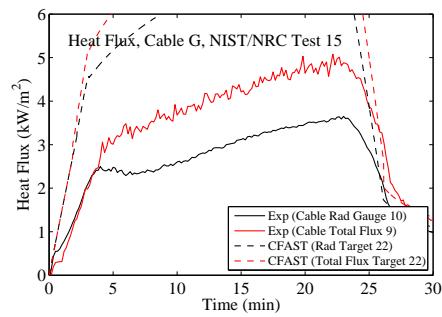
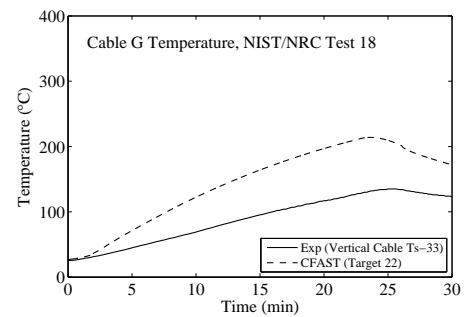
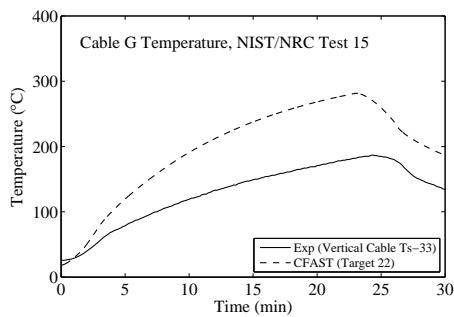


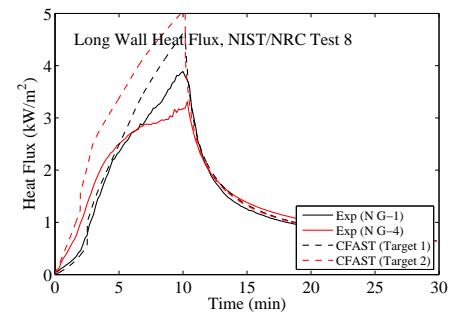
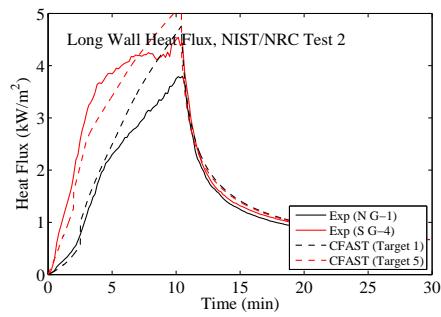
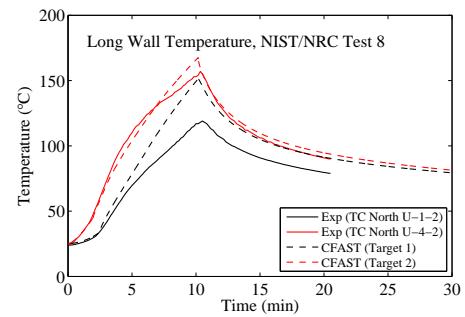
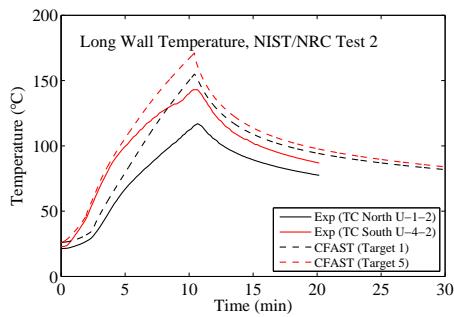
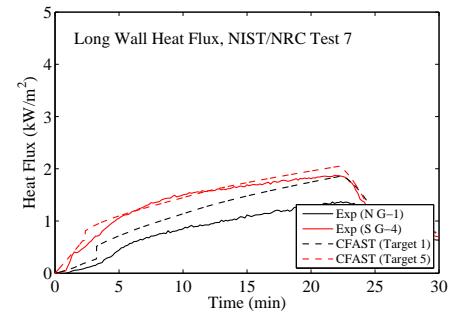
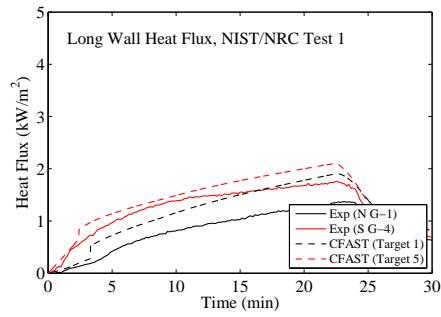
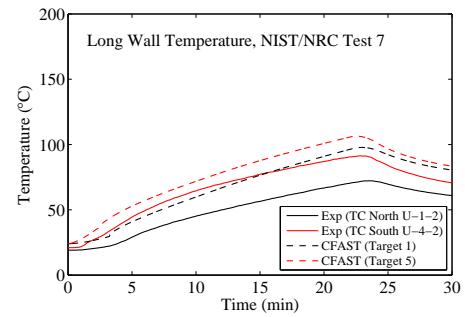
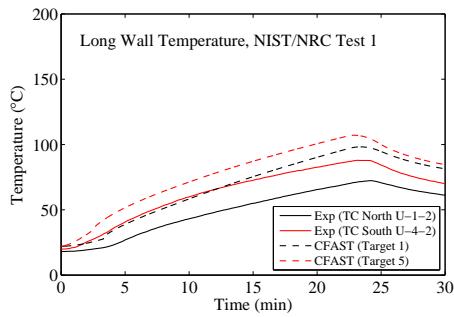


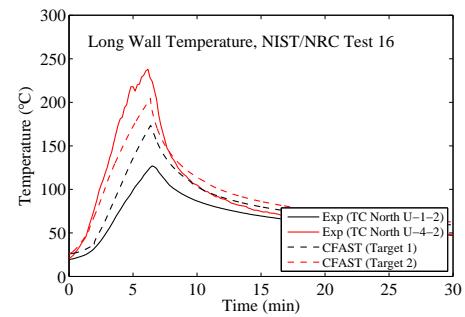
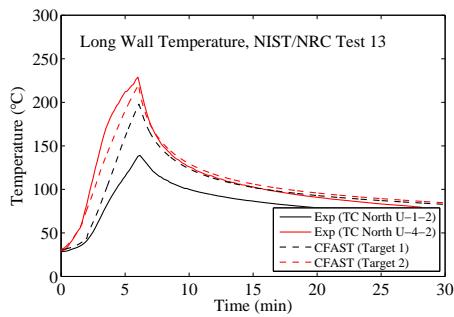
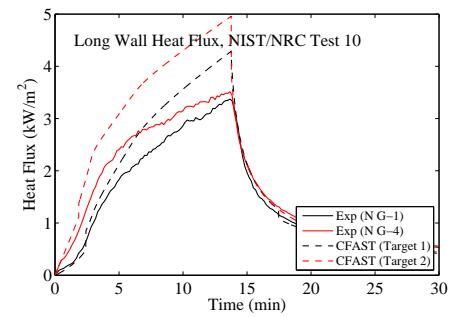
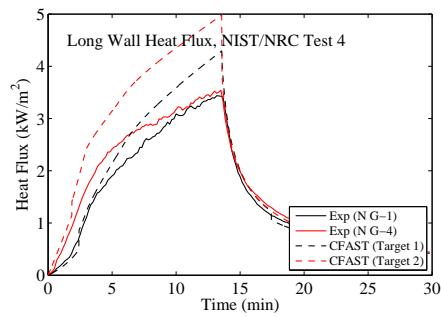
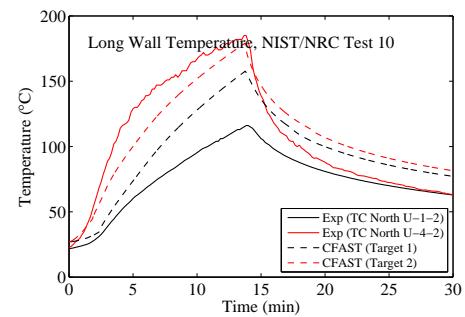
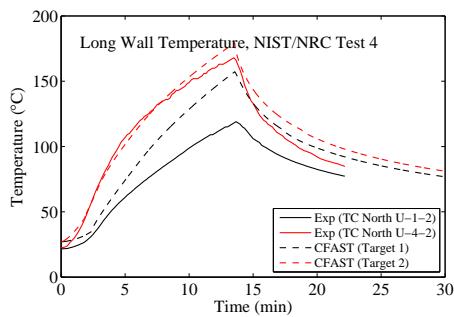




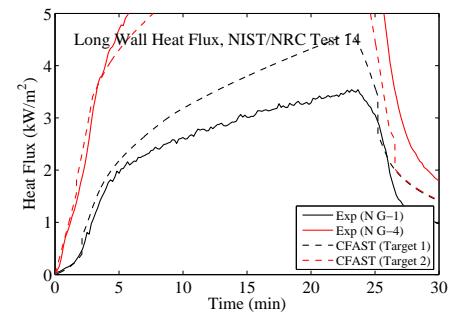
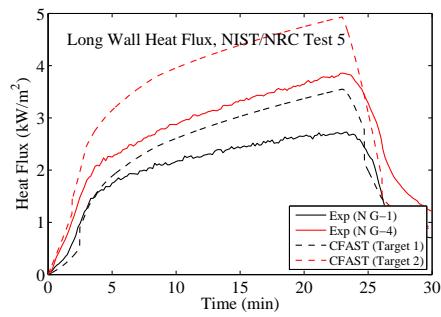
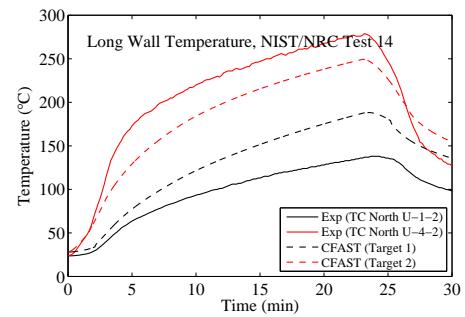
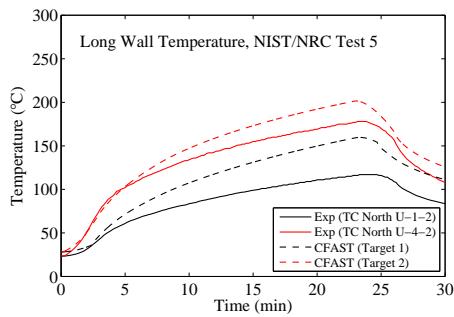
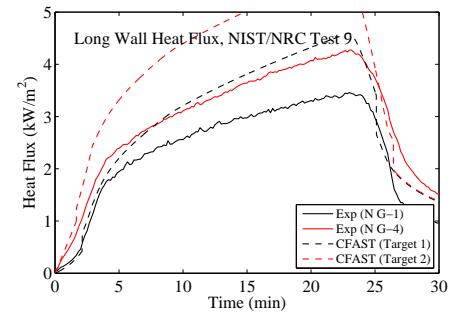
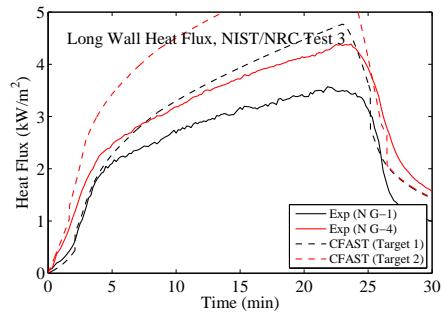
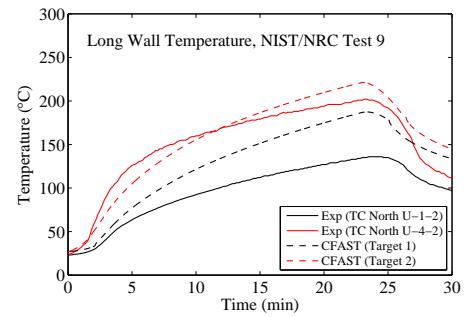
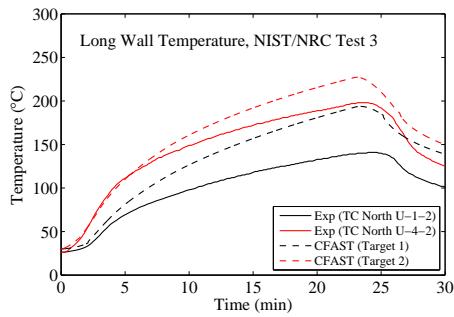


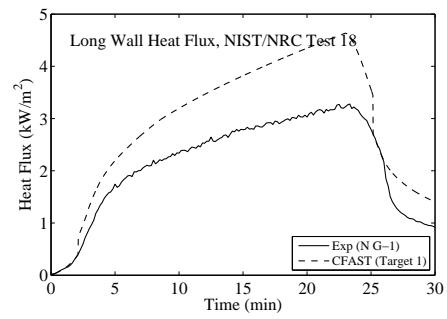
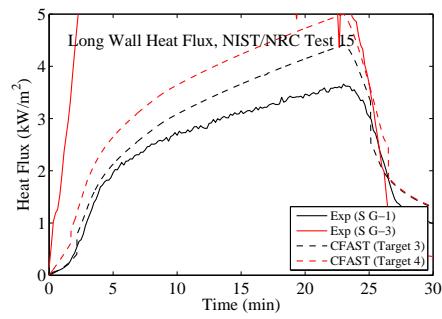
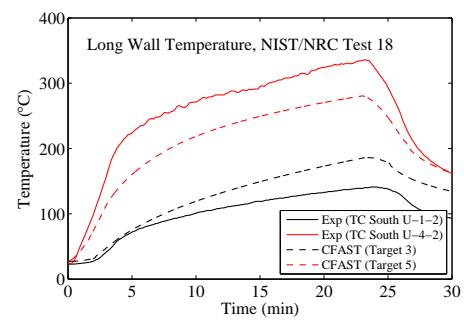
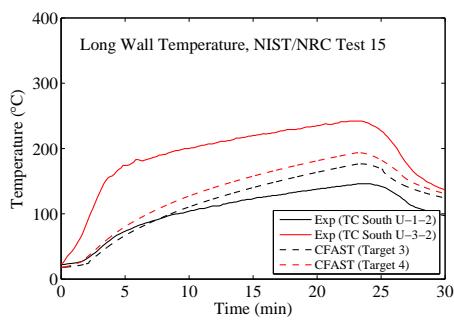


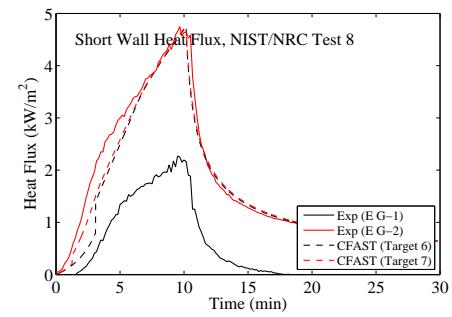
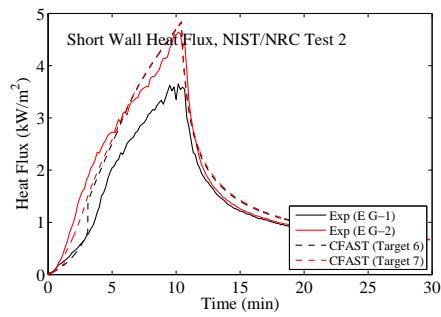
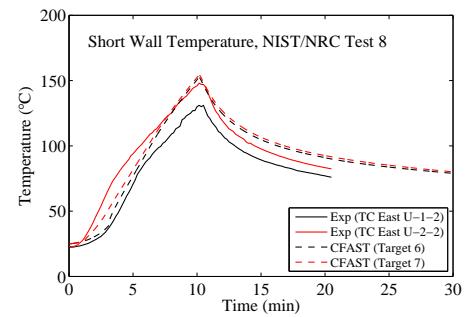
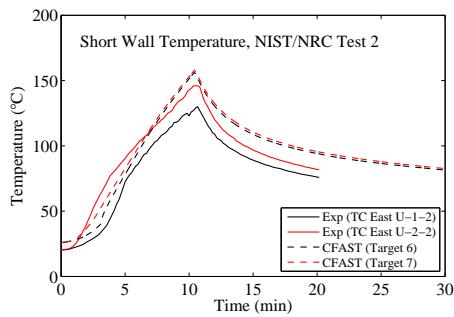
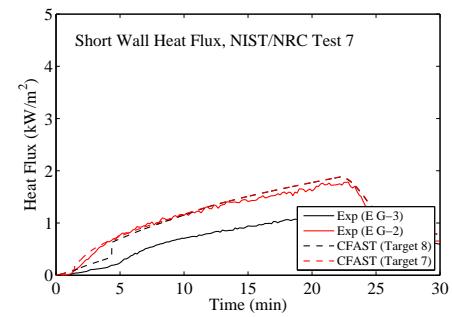
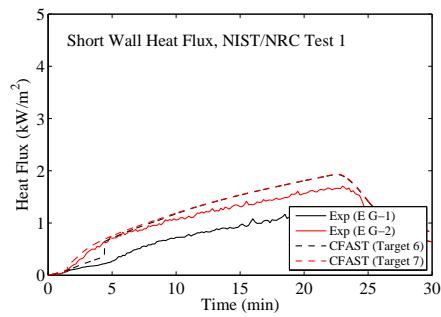
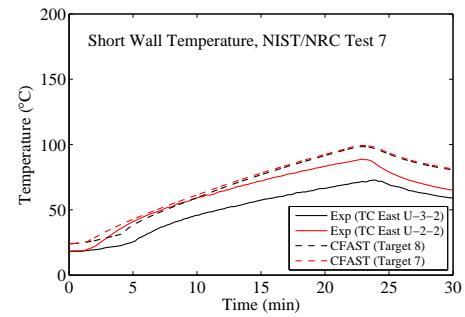
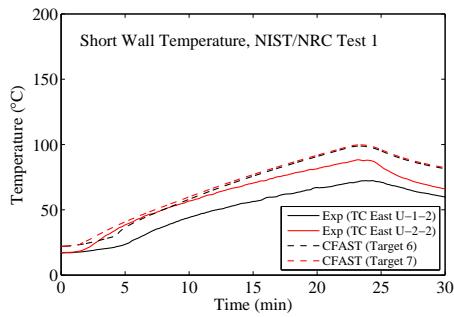


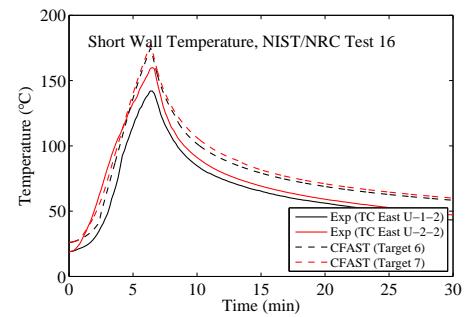
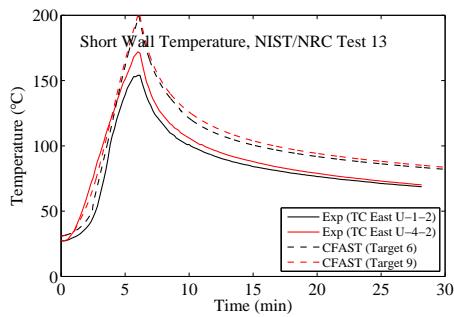
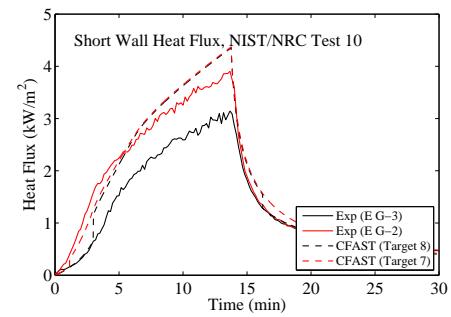
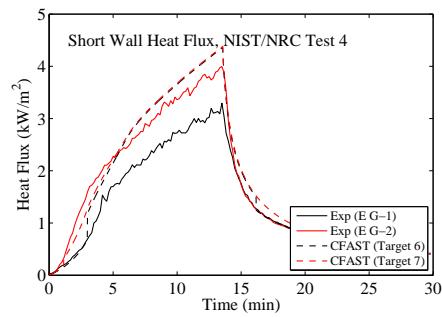
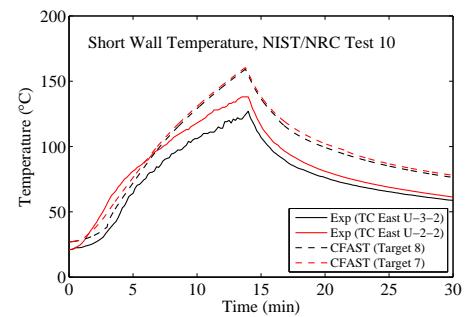
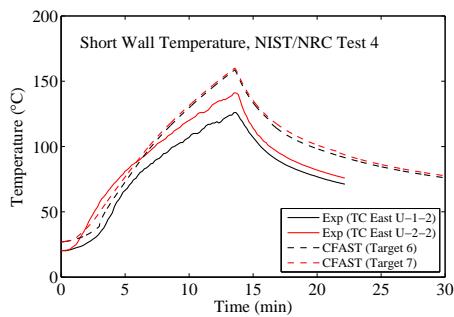


Experimental Heat Flux Data Not Available Experimental Heat Flux Data Not Available

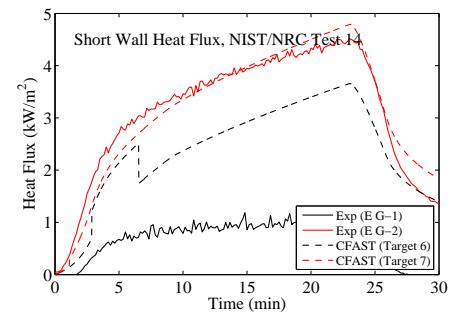
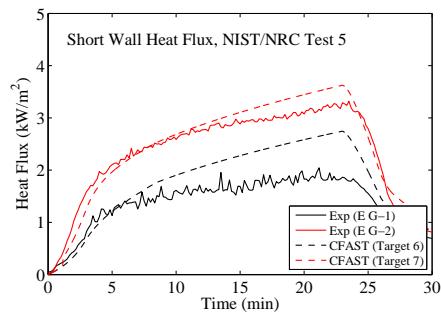
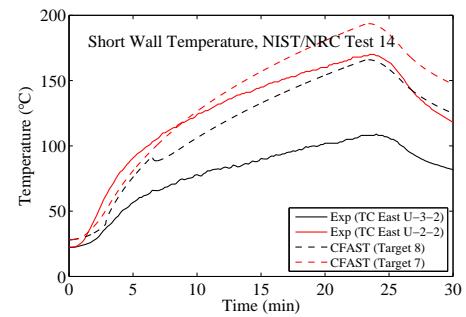
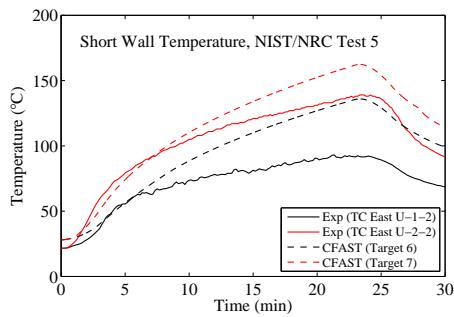
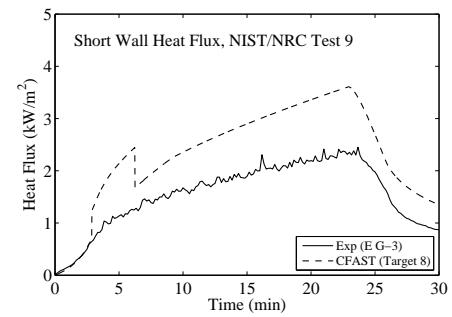
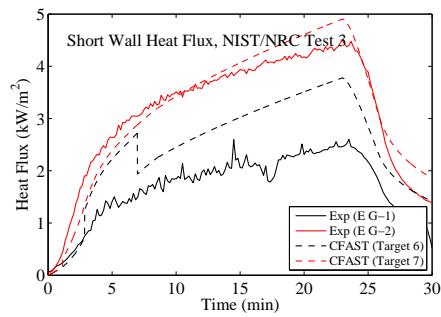
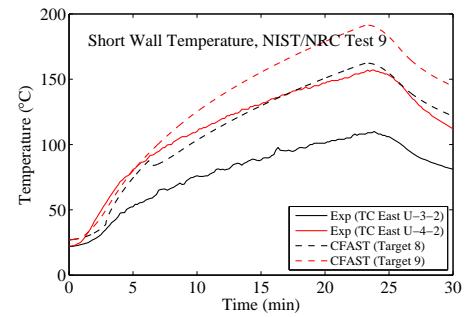
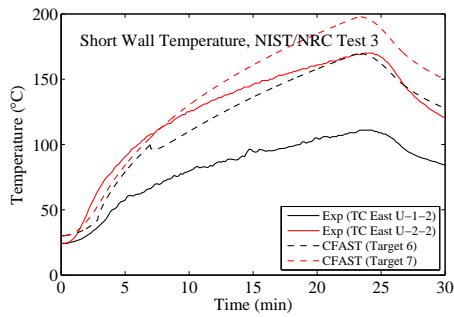


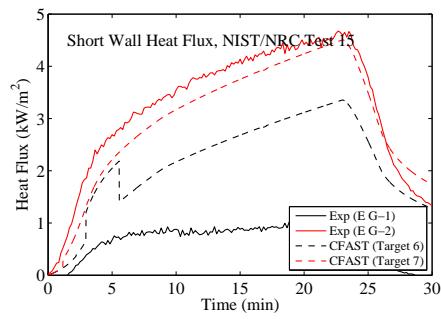
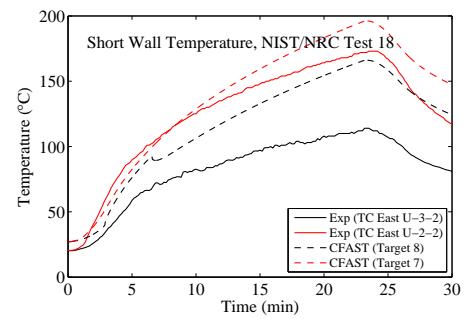
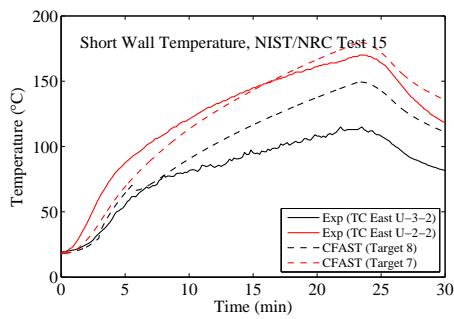




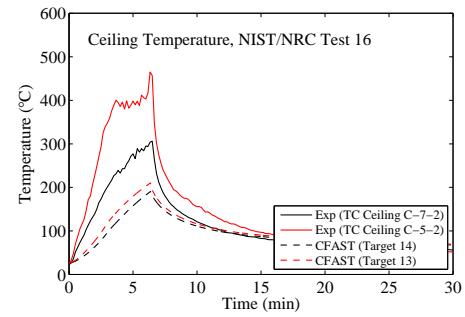
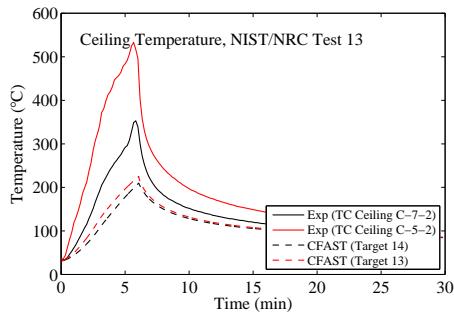
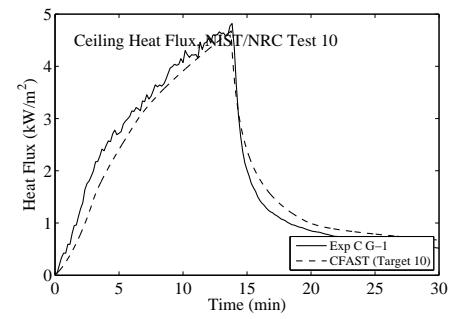
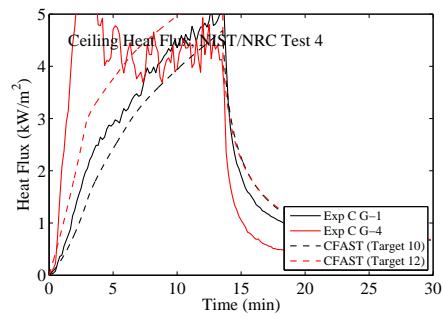
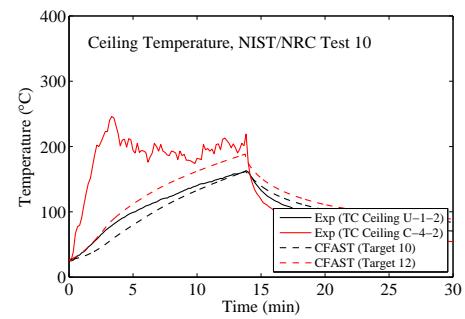
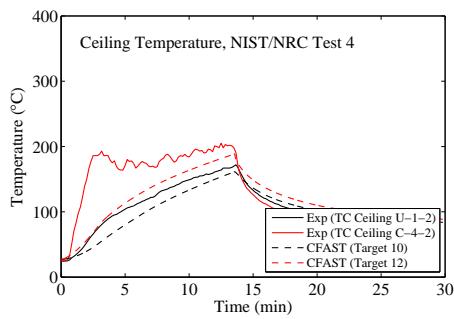


Experimental Heat Flux Data Not Available Experimental Heat Flux Data Not Available

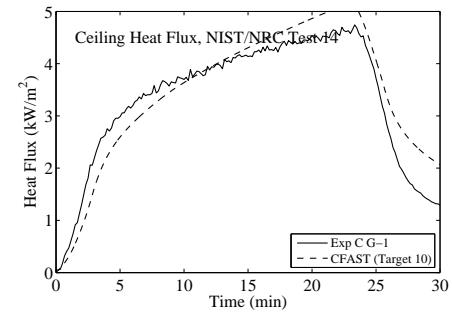
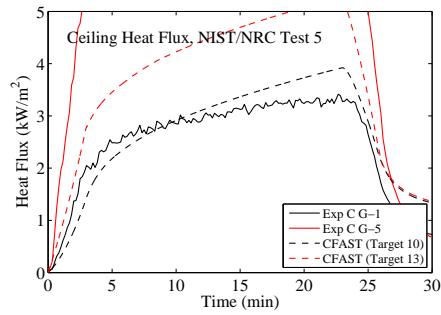
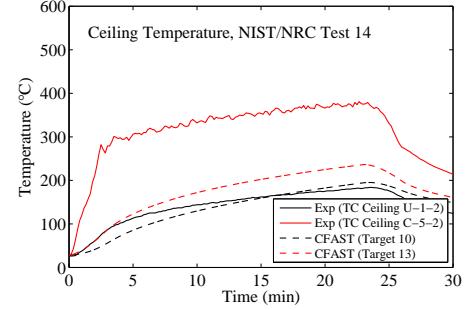
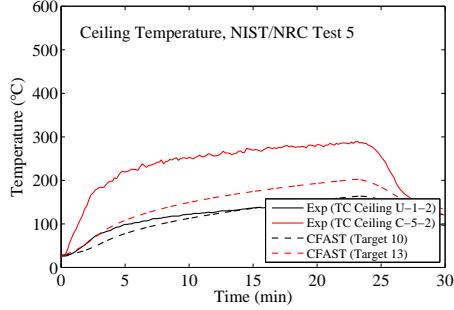
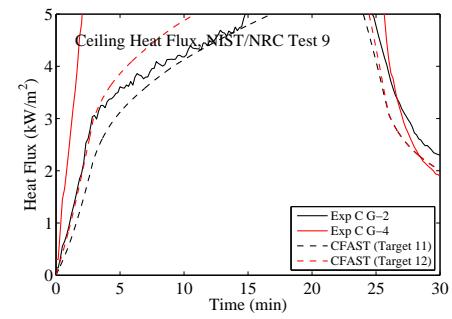
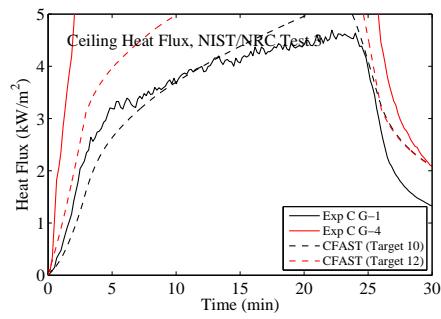
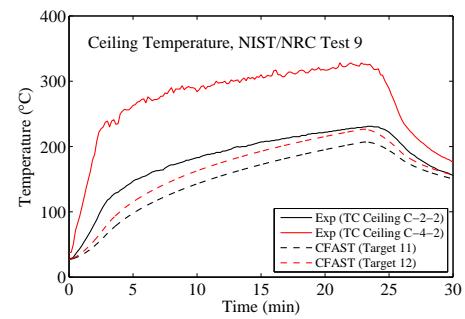
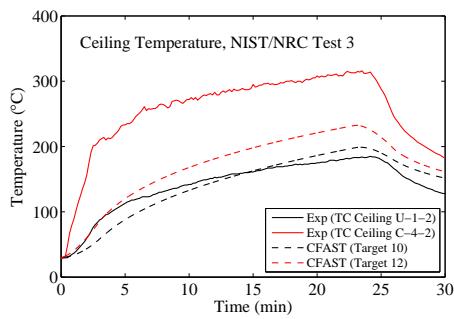


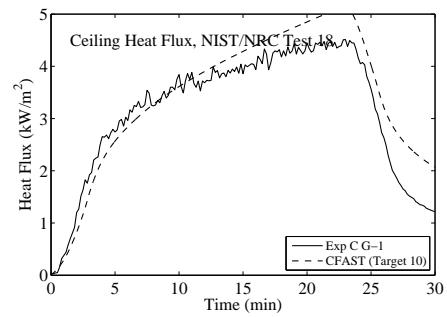
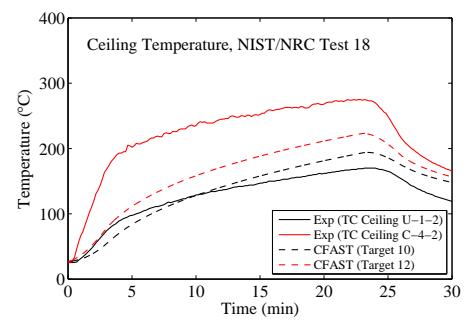
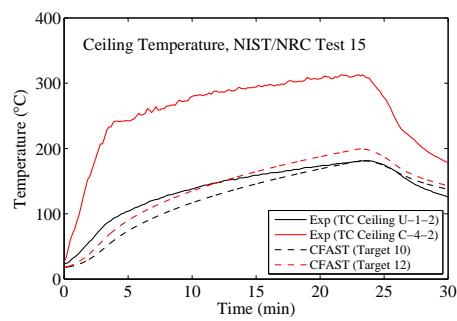


Experimental Heat Flux Data Not Available

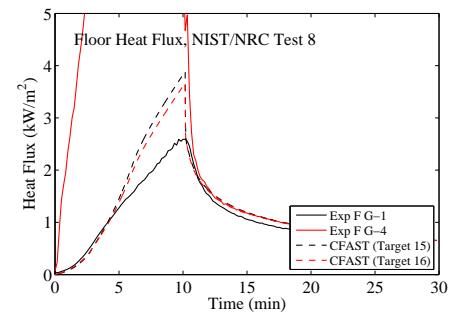
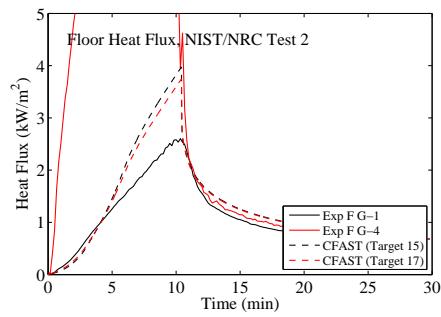
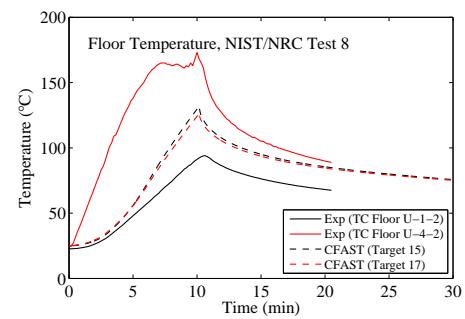
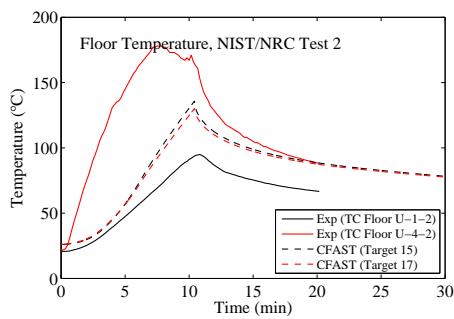
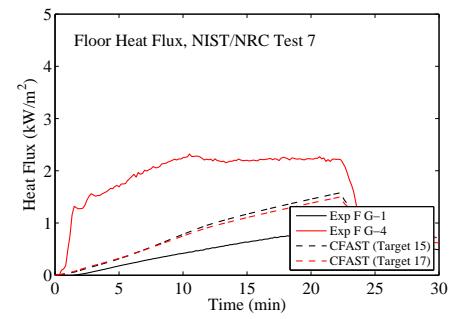
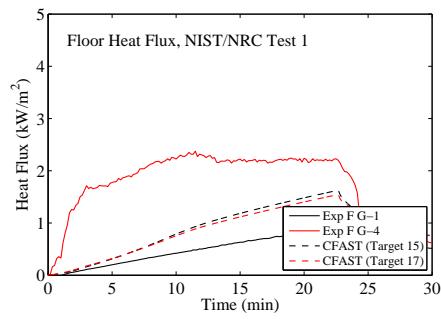
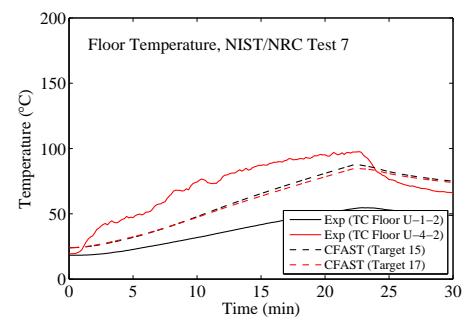
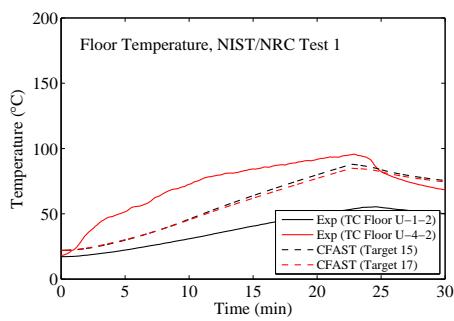


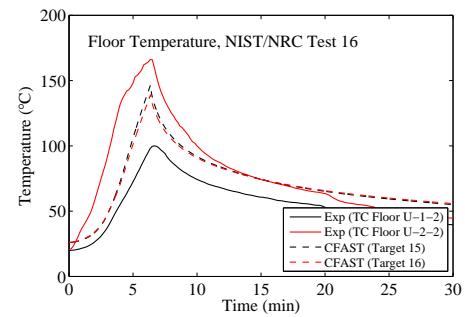
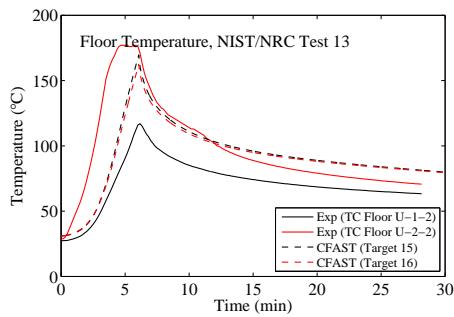
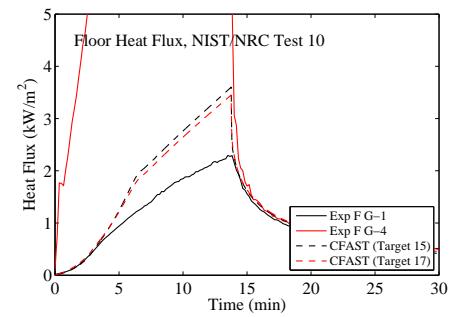
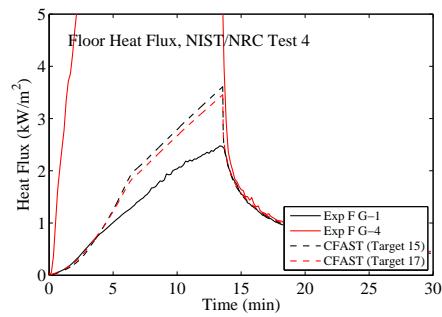
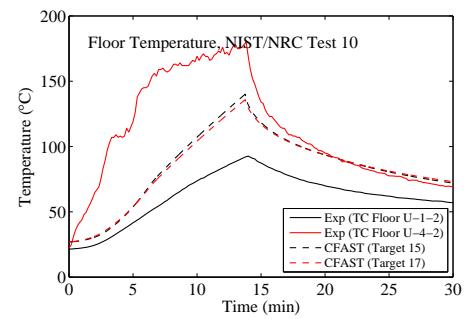
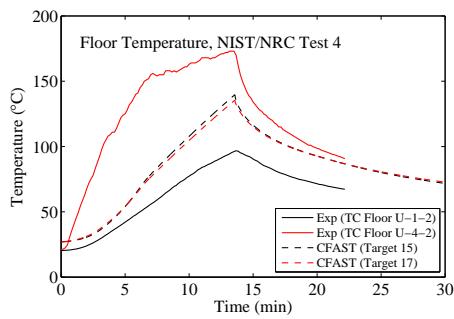
Experimental Heat Flux Data Not Available Experimental Heat Flux Data Not Available



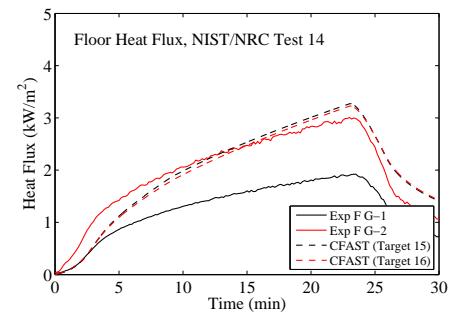
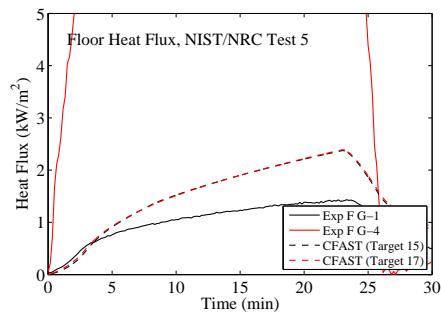
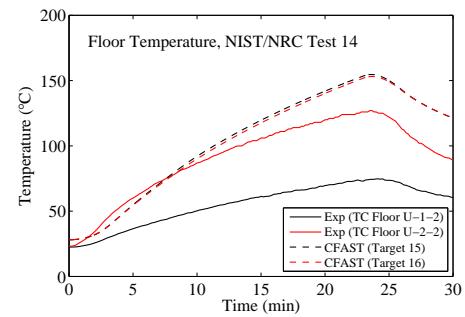
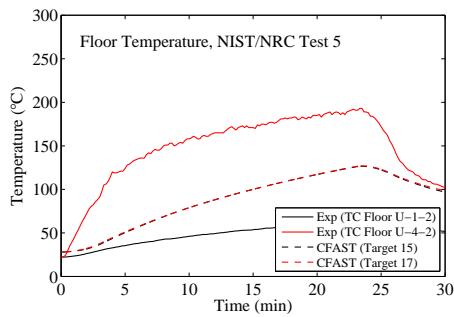
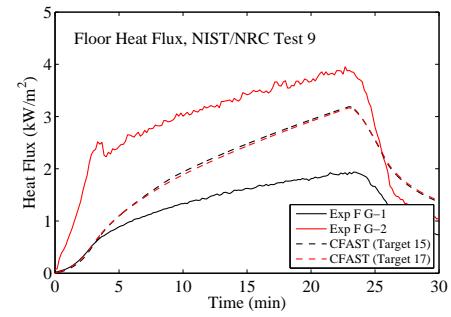
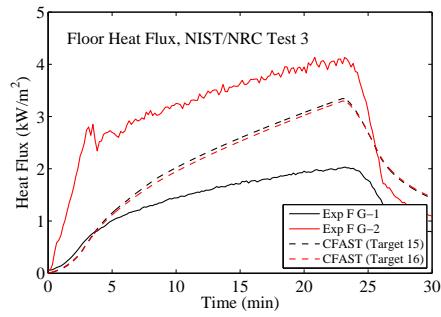
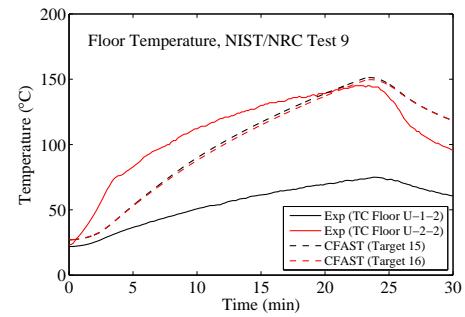
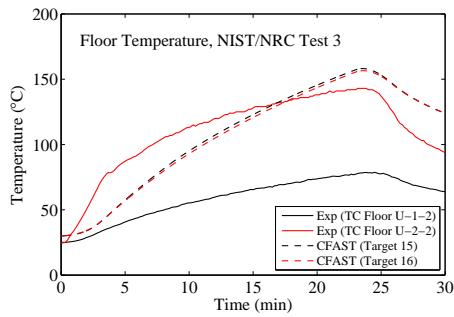


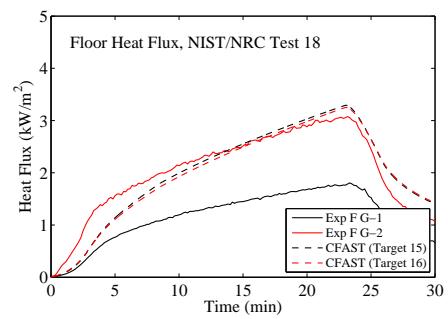
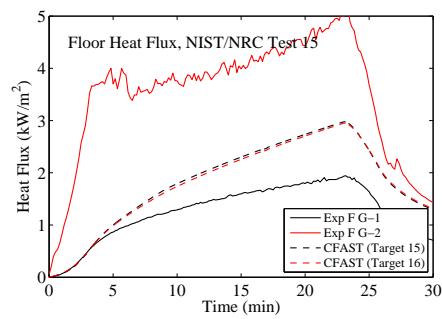
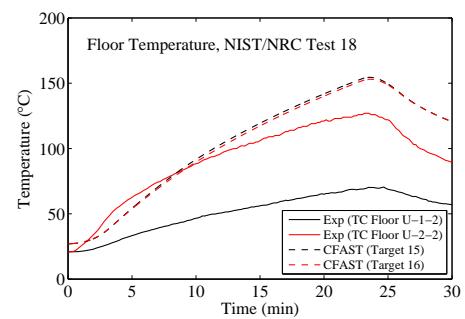
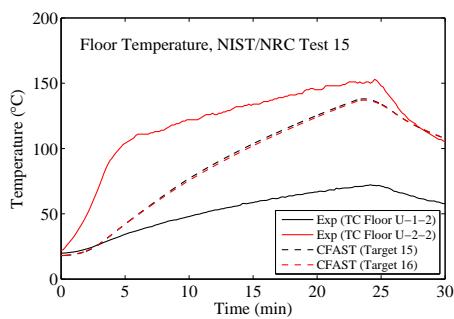
Experimental Heat Flux Data Not Available



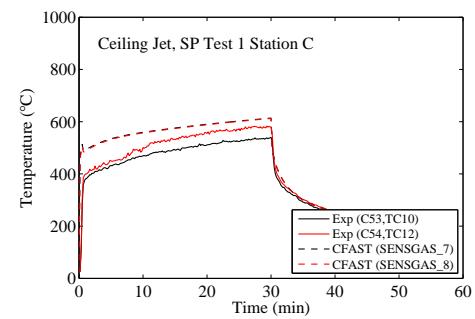
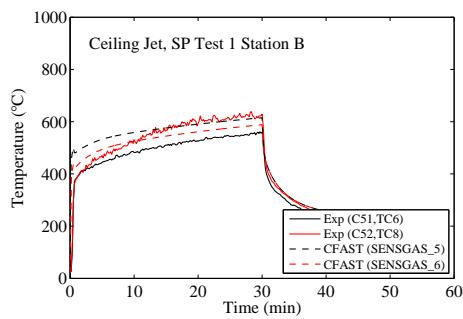
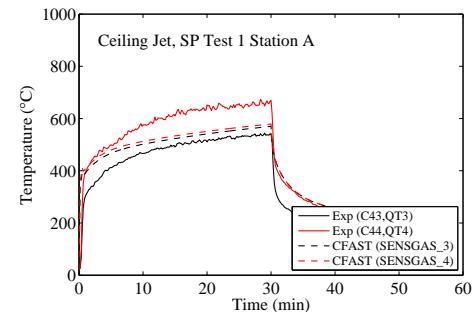
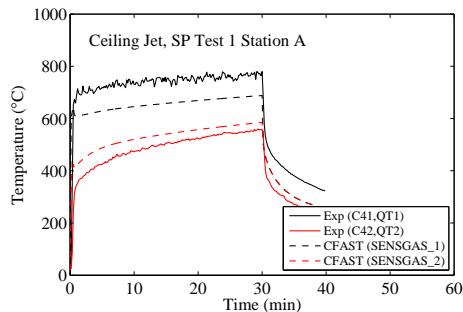


Experimental Heat Flux Data Not Available Experimental Heat Flux Data Not Available

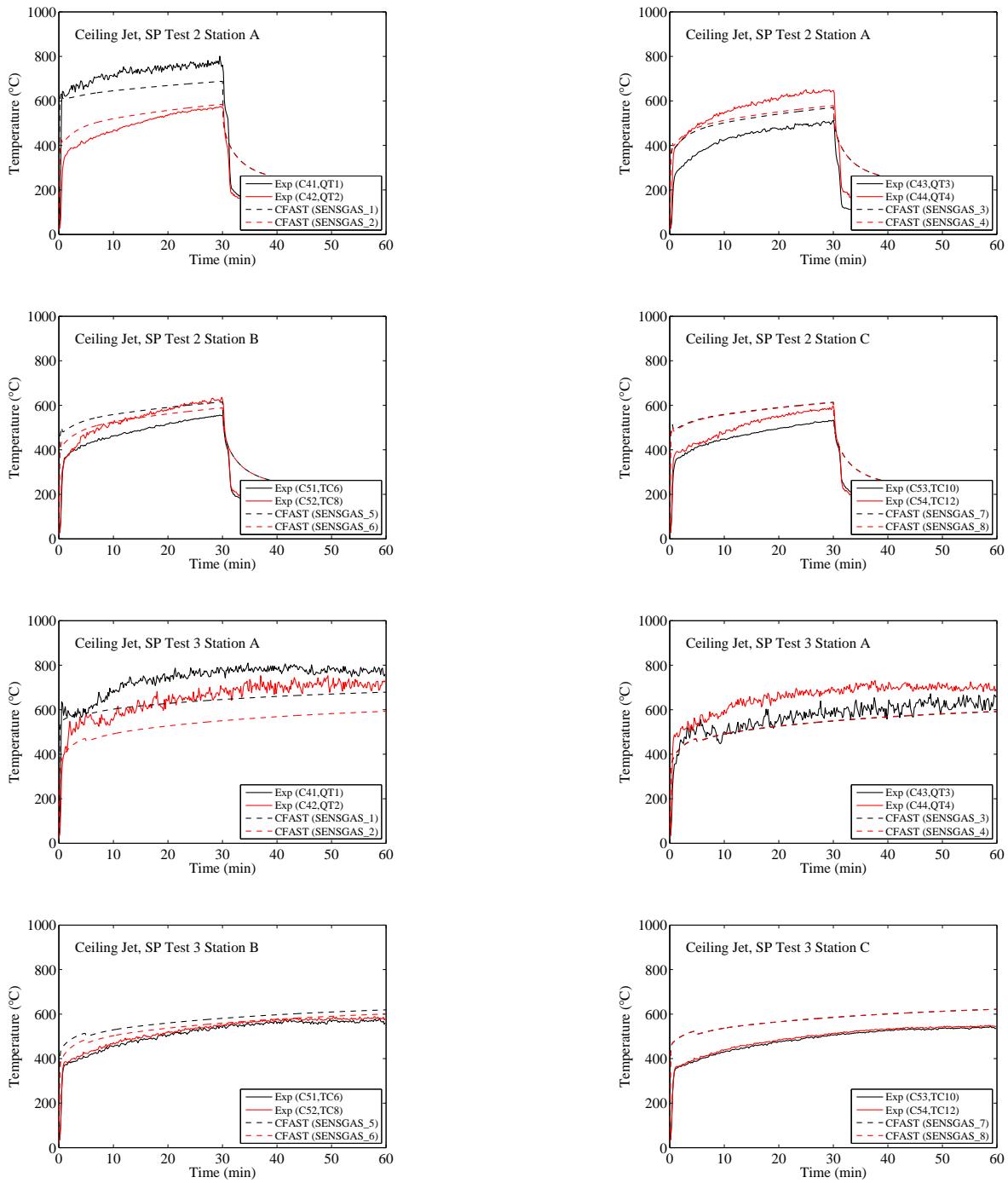




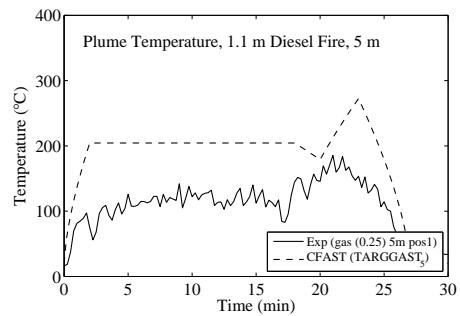
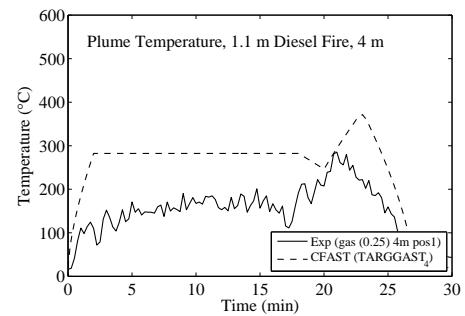
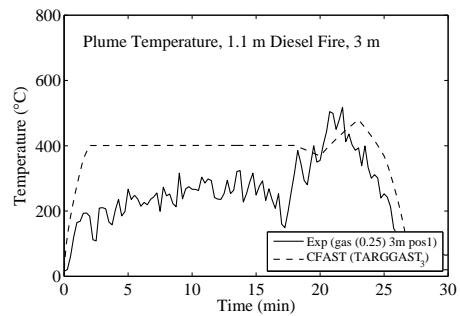
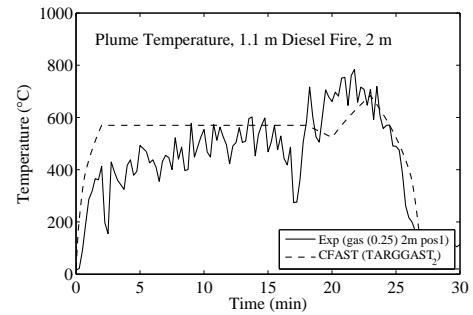
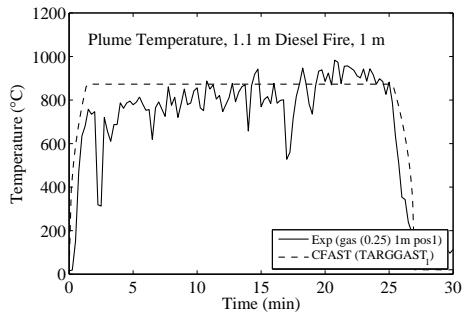
B.8 SP Adiabatic Surface Temperature Experiments



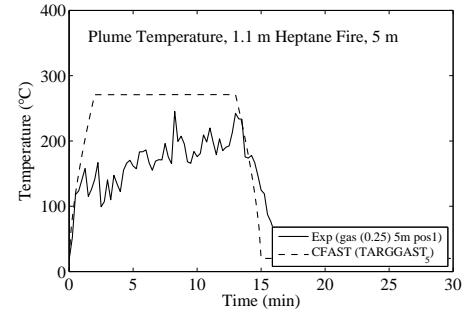
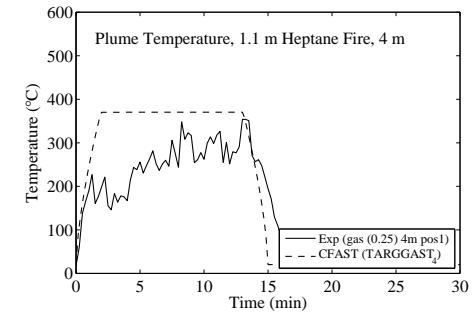
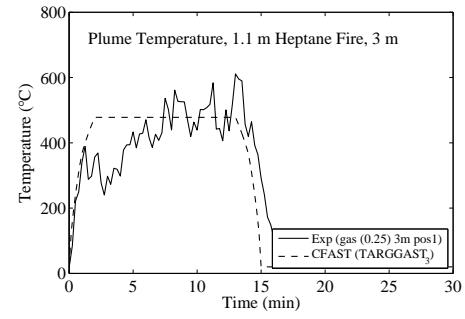
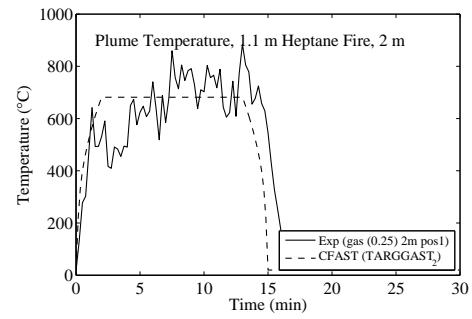
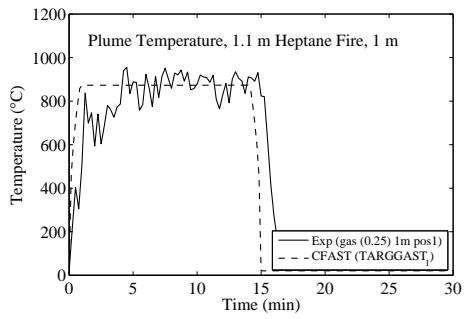
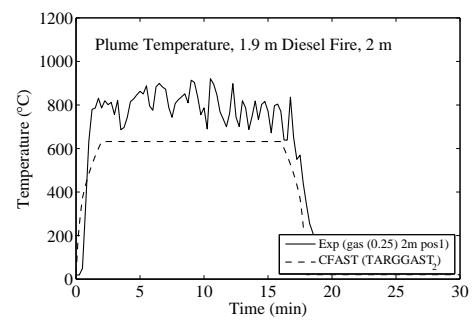
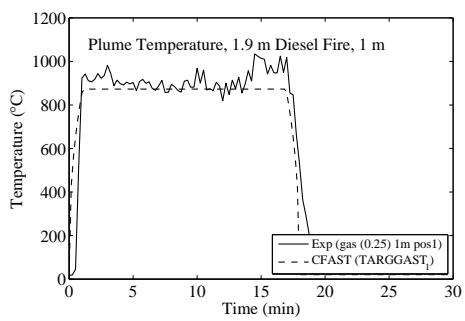
SP ADIABATIC SURFACE TEMPERATURE EXPERIMENTS



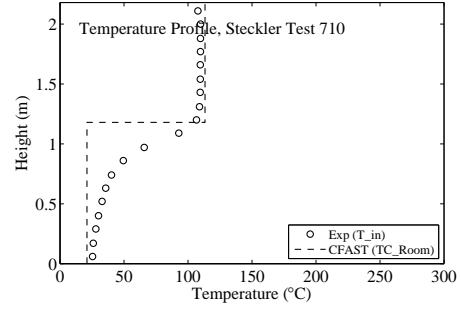
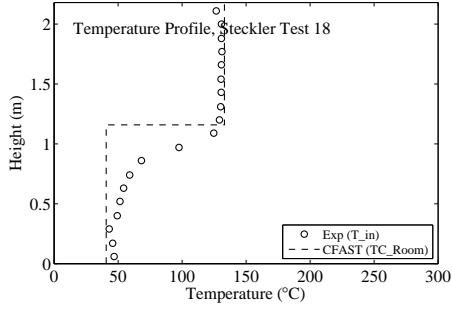
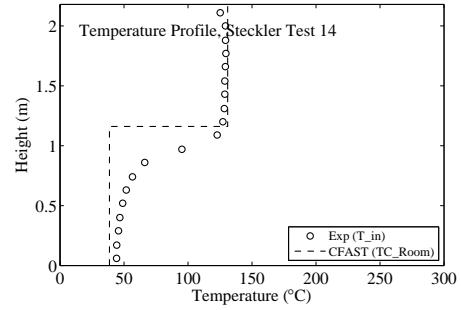
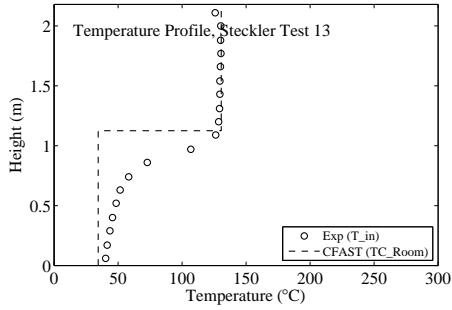
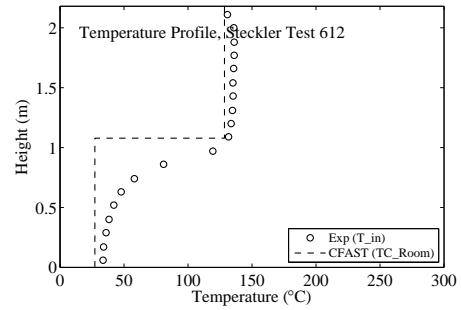
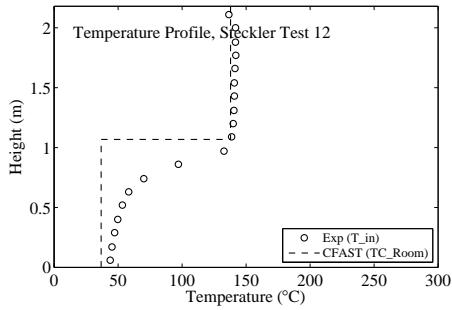
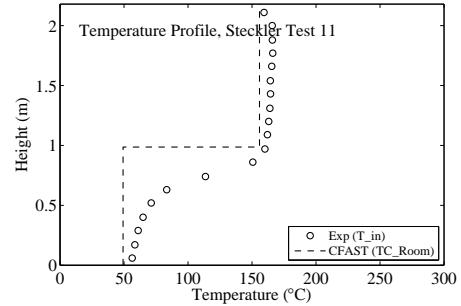
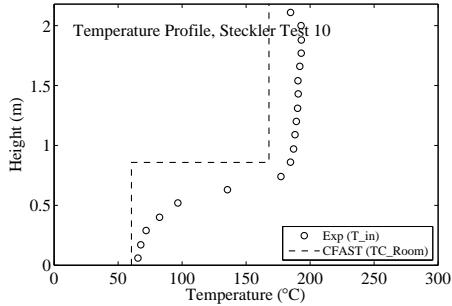
SP ADIABATIC SURFACE TEMPERATURE EXPERIMENTS



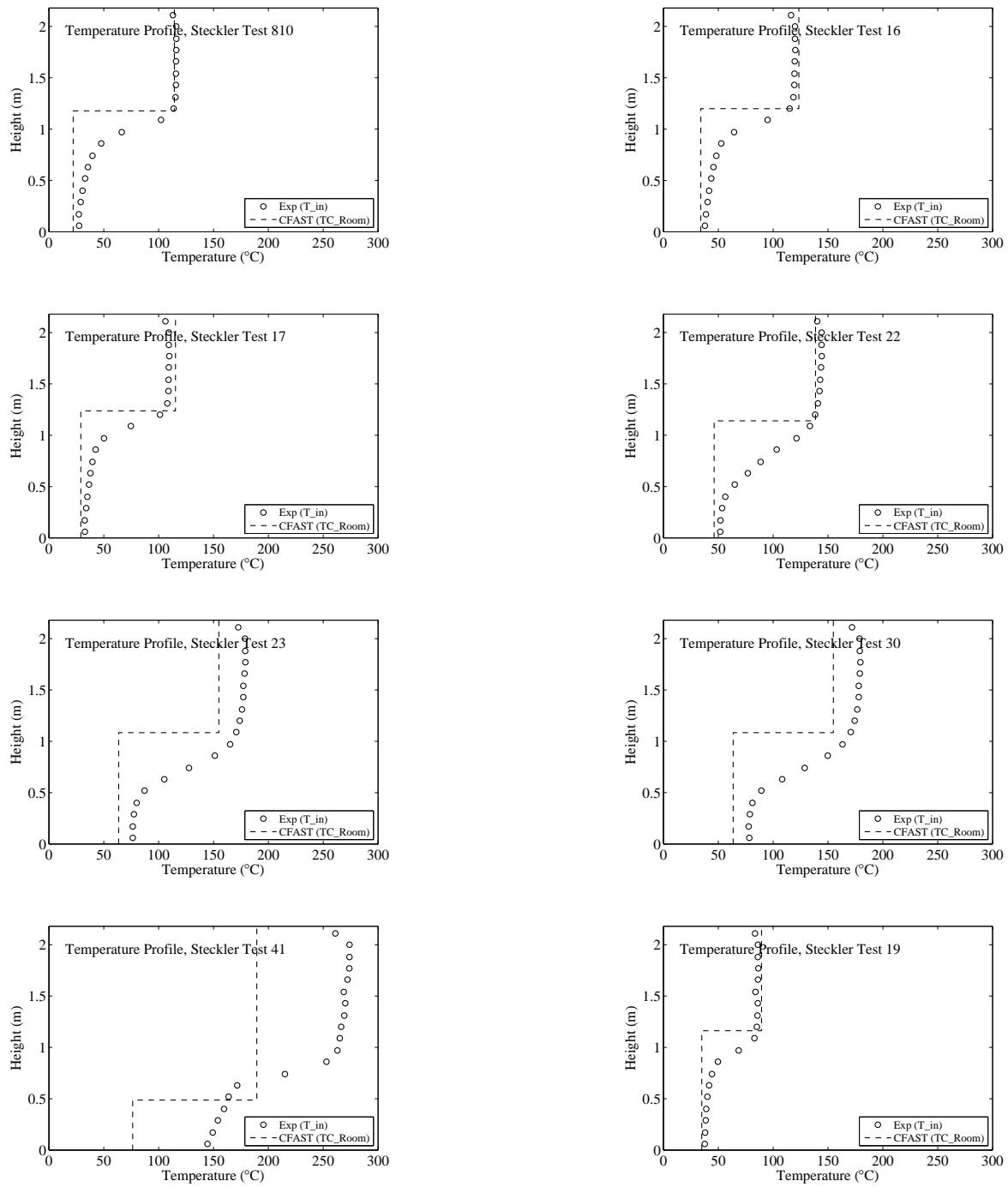
SP ADIABATIC SURFACE TEMPERATURE EXPERIMENTS



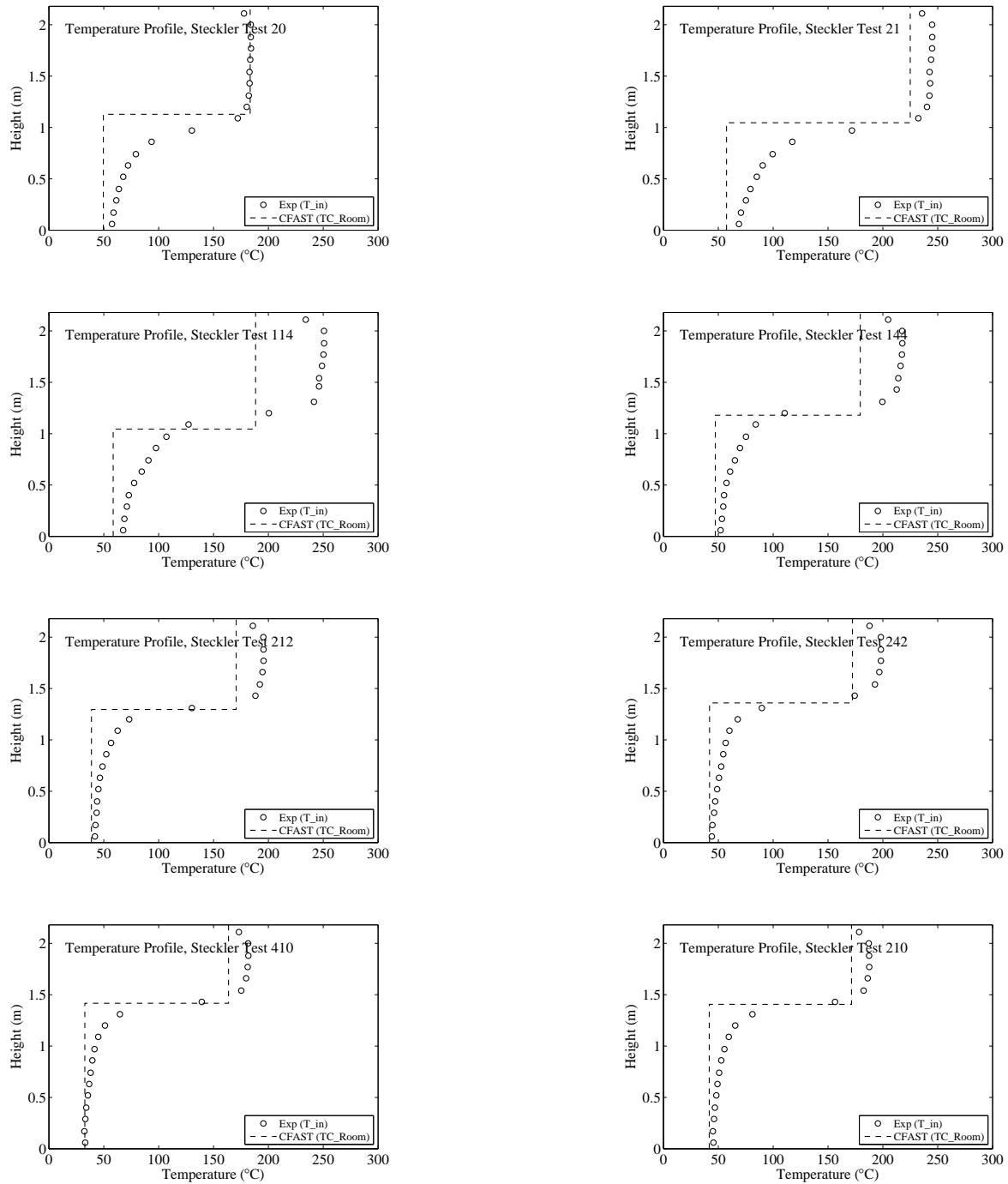
B.9 Steckler Compartment Experiments



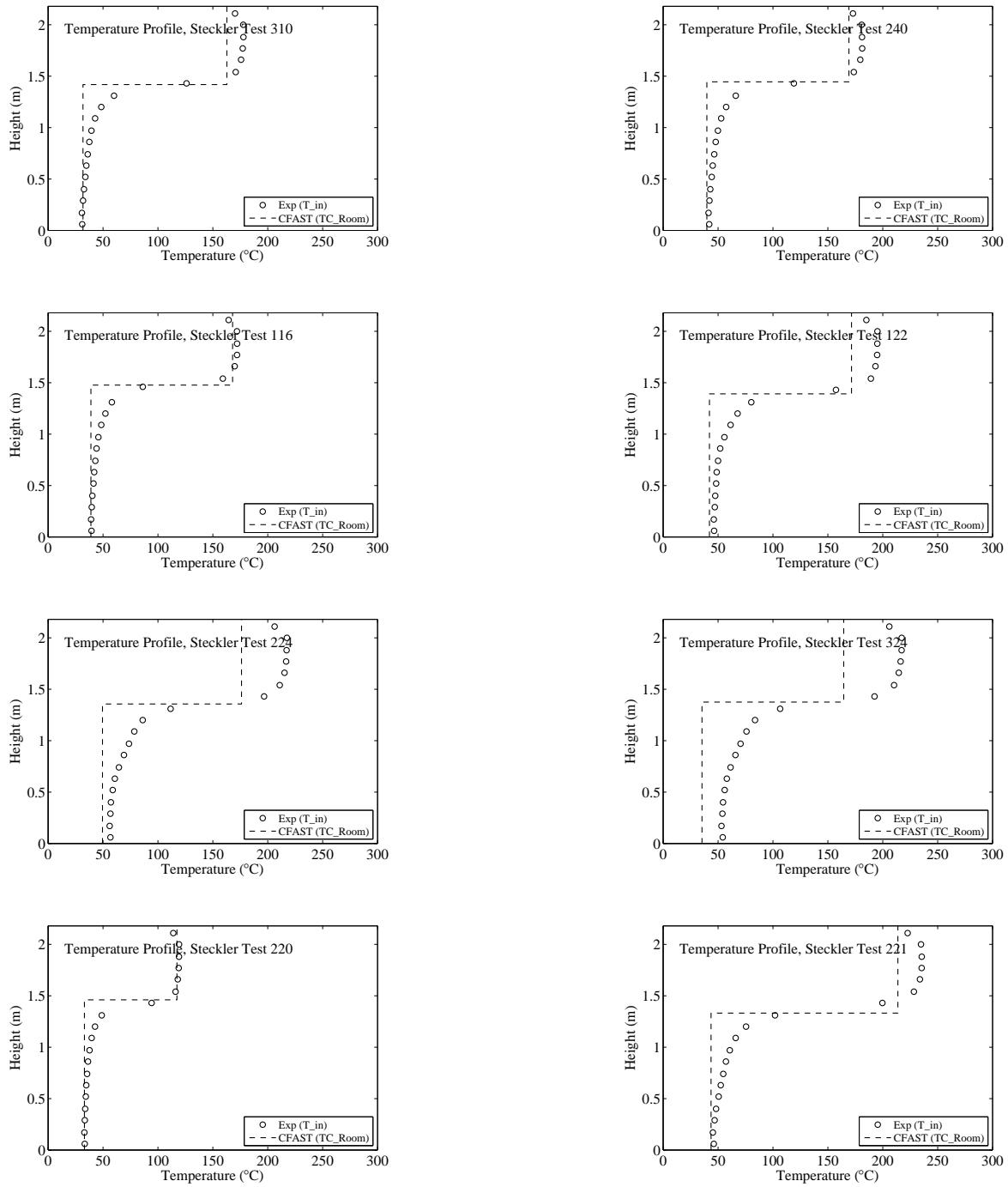
STECKLER COMPARTMENT EXPERIMENTS



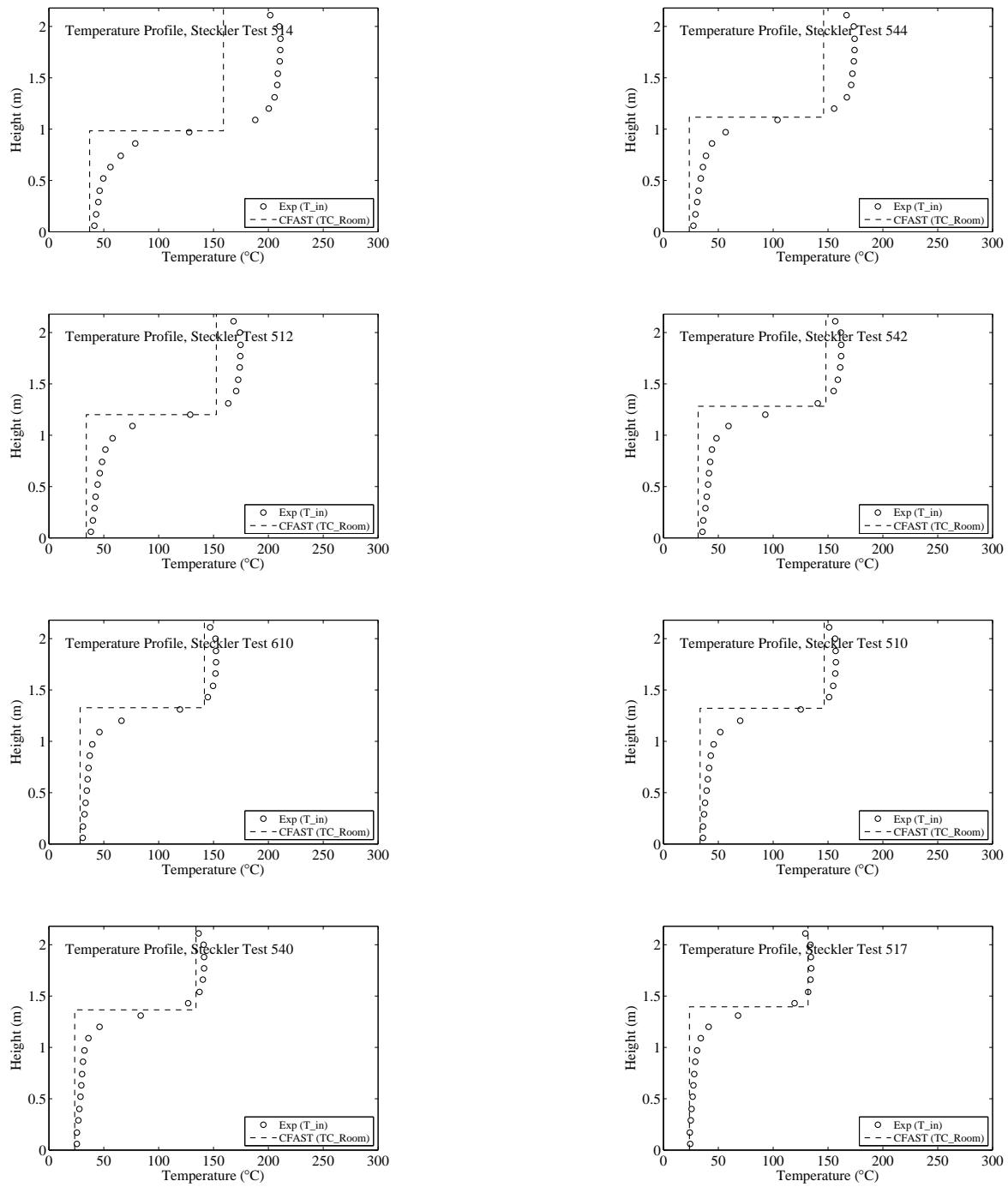
STECKLER COMPARTMENT EXPERIMENTS



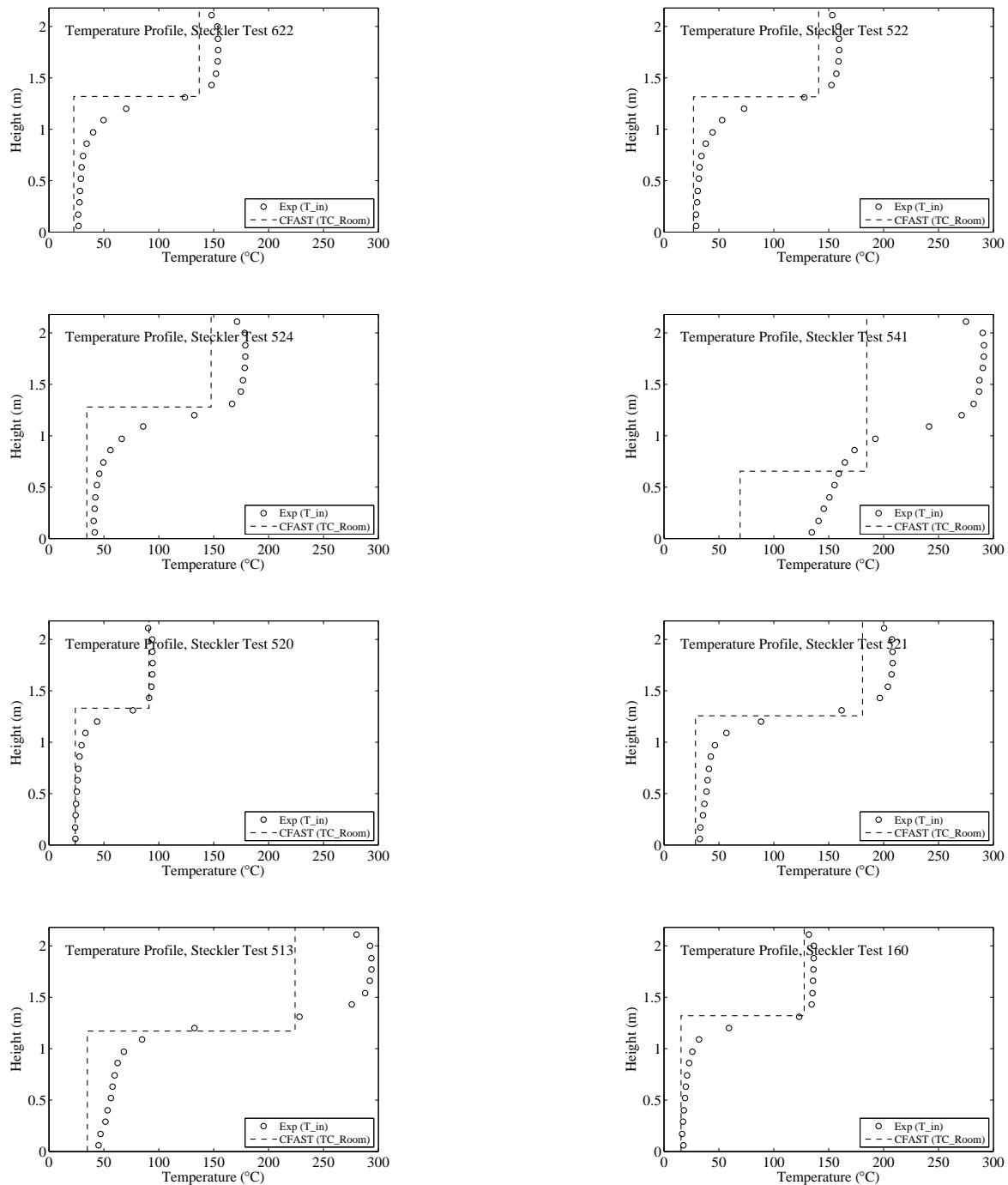
STECKLER COMPARTMENT EXPERIMENTS



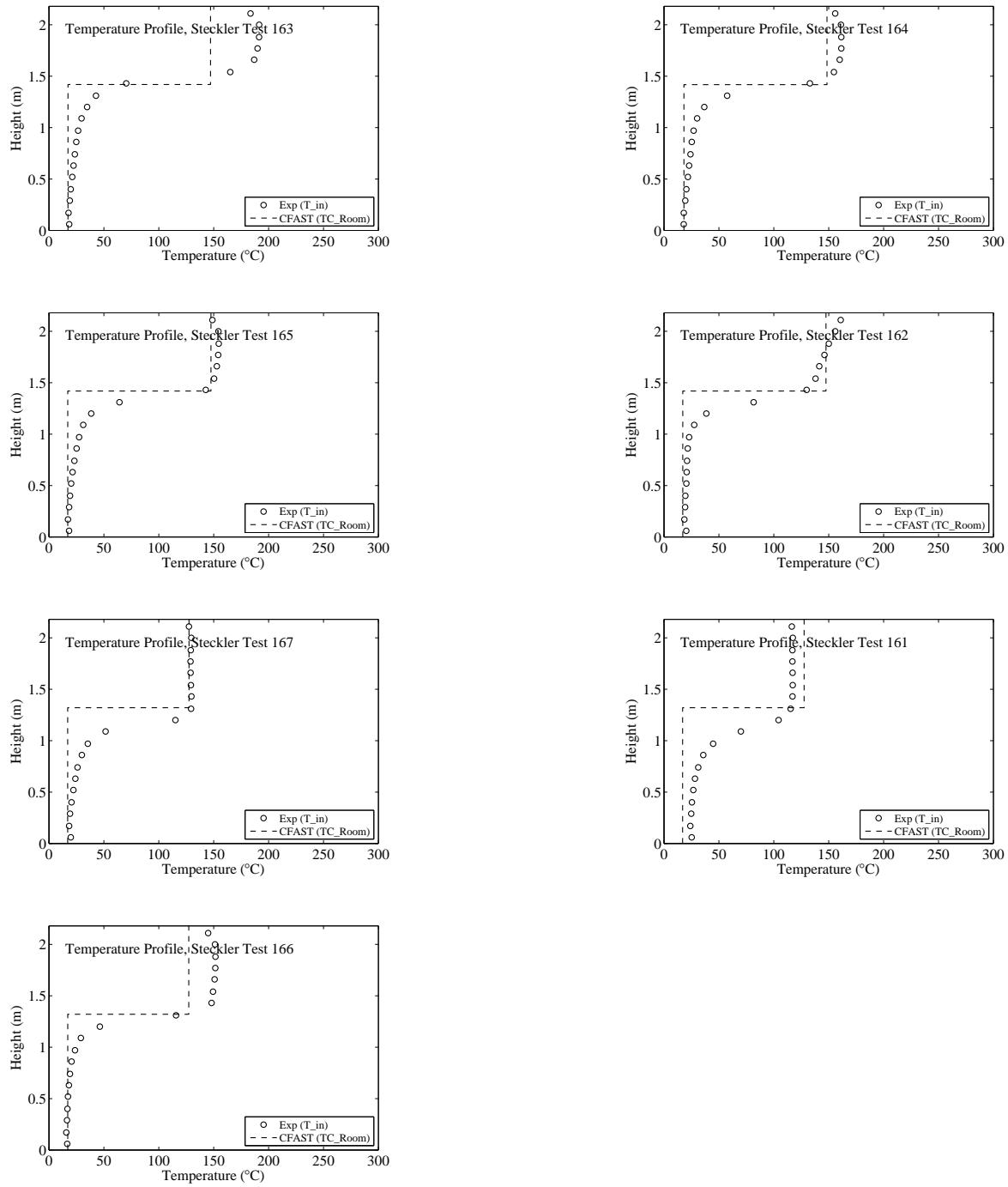
STECKLER COMPARTMENT EXPERIMENTS



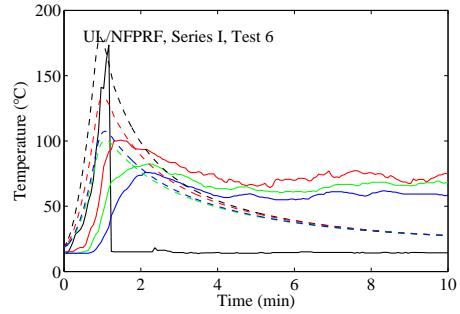
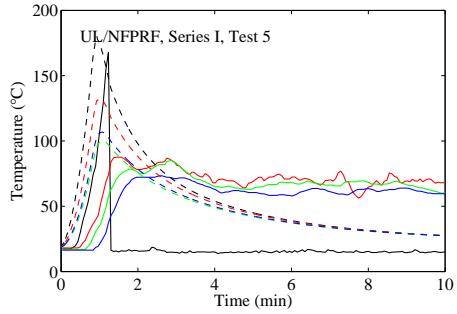
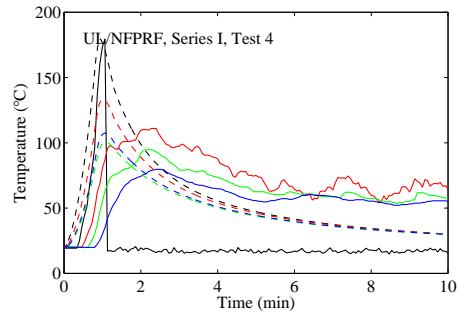
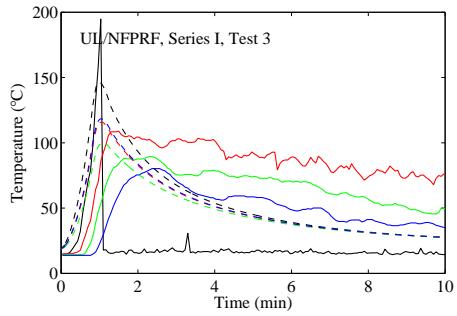
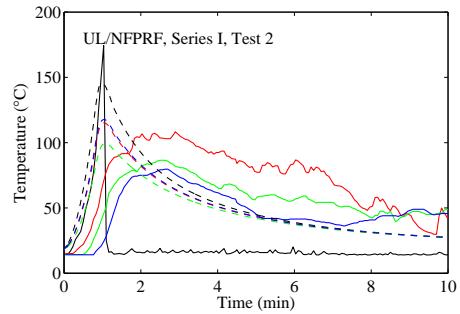
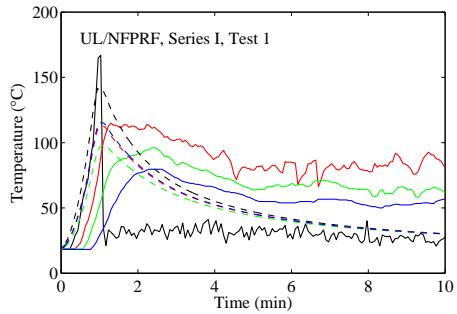
STECKLER COMPARTMENT EXPERIMENTS



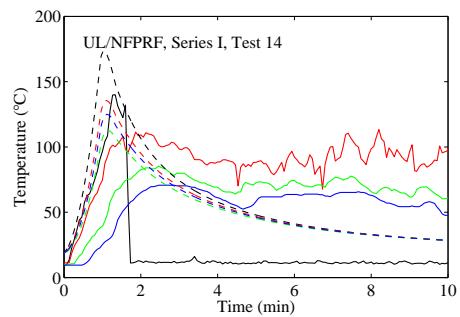
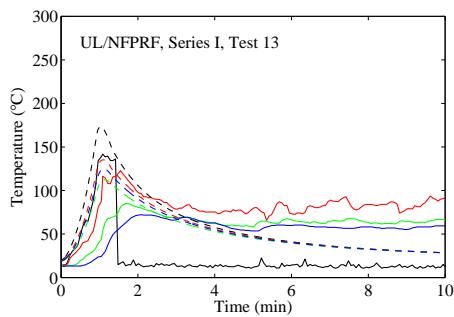
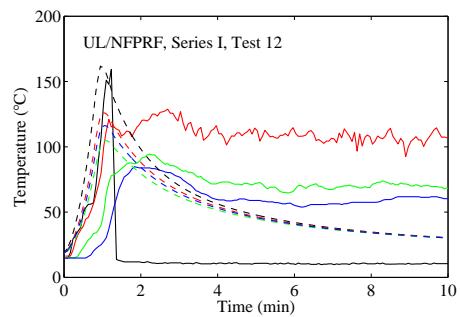
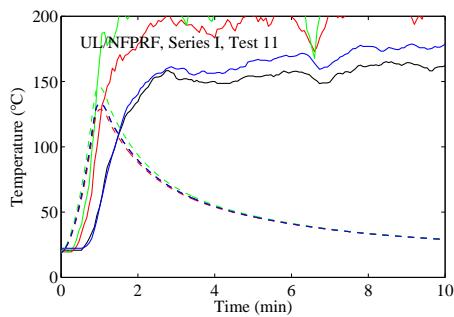
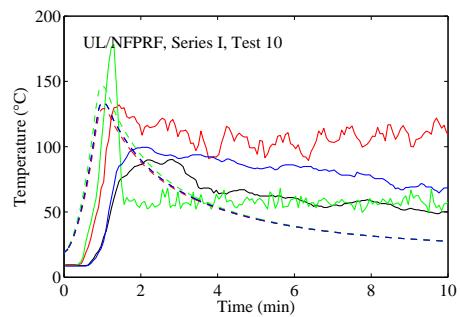
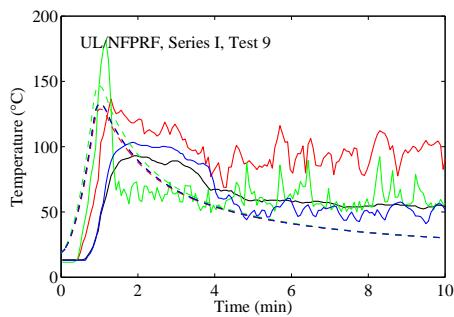
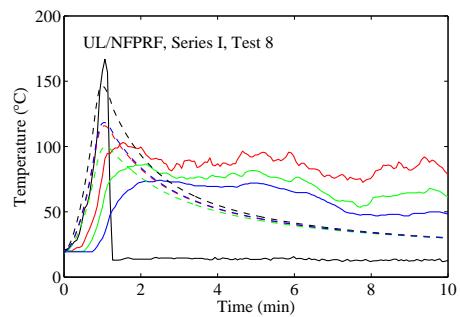
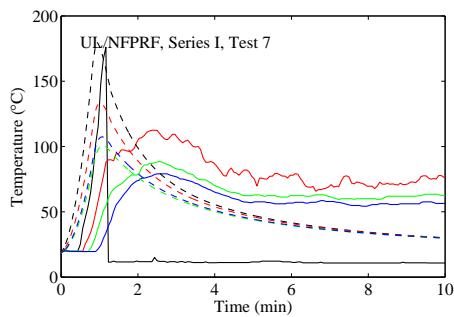
STECKLER COMPARTMENT EXPERIMENTS



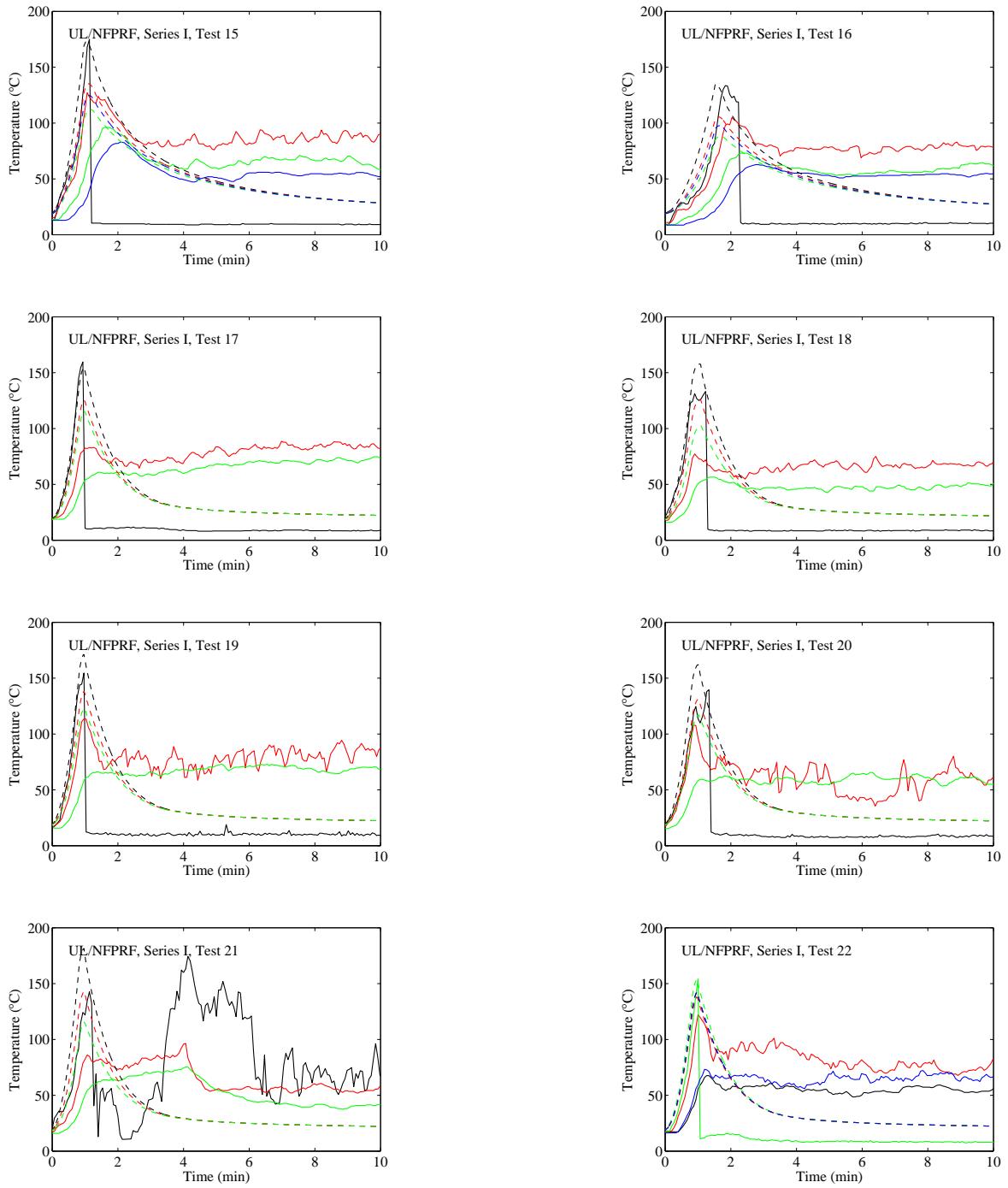
B.10 UL/NFPRF Series I Experiments



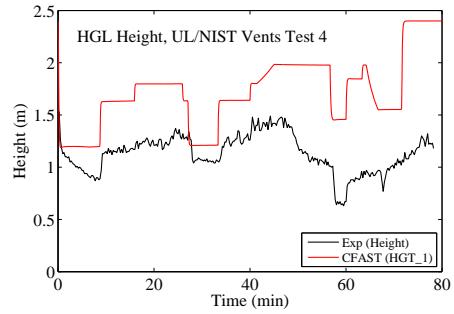
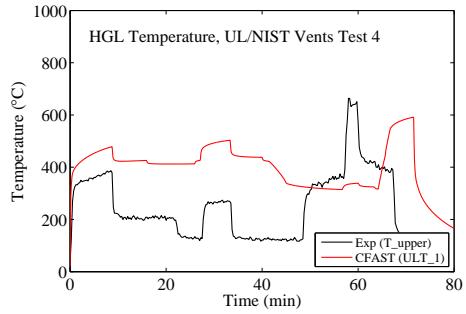
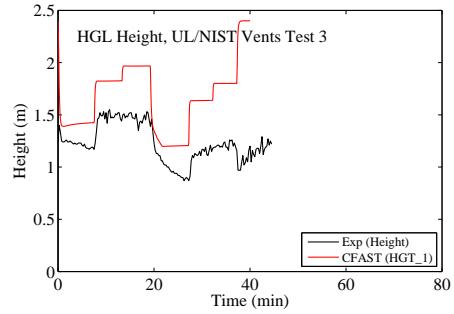
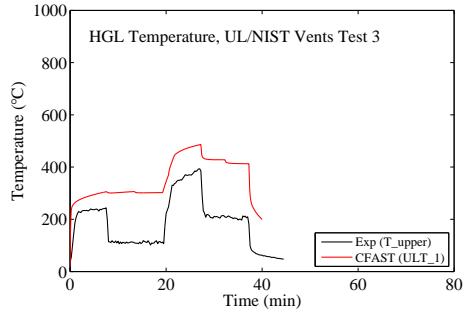
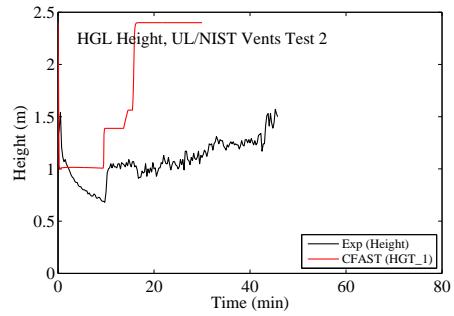
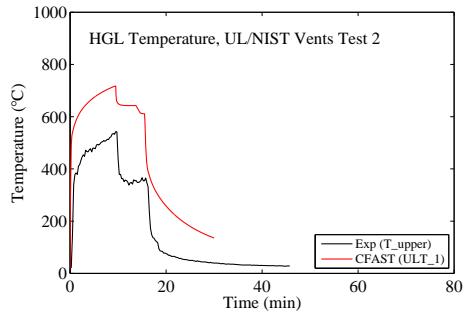
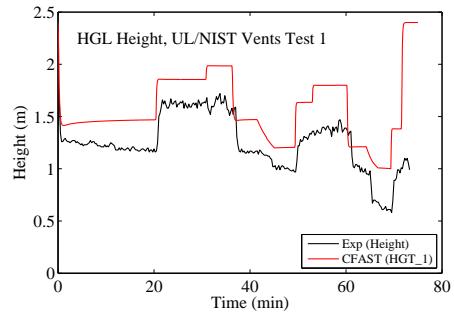
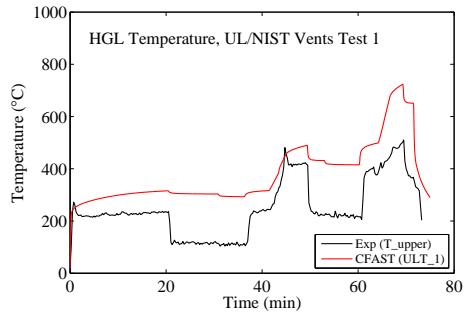
UL/NFPRF SERIES I EXPERIMENTS



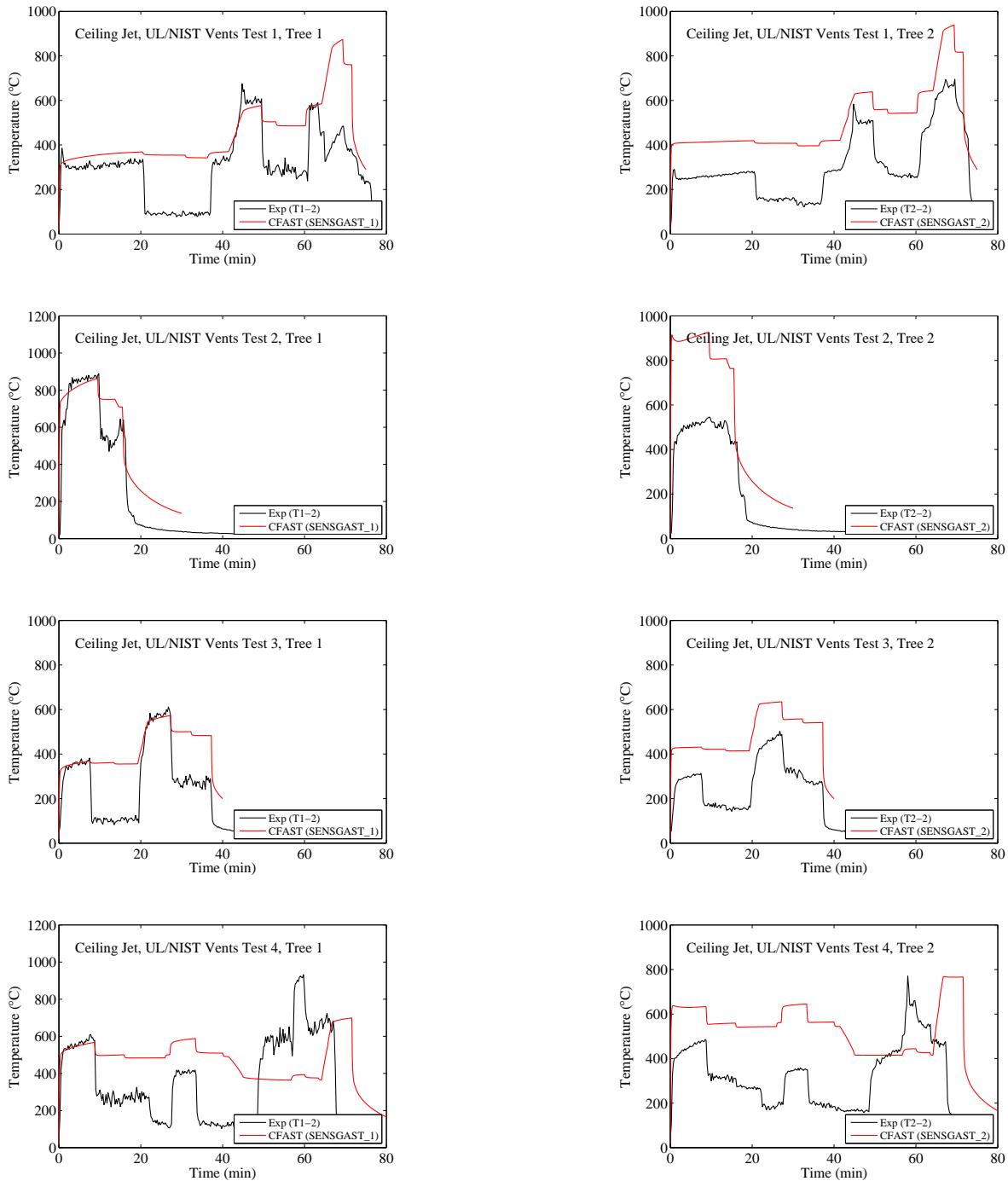
UL/NFPRF SERIES I EXPERIMENTS



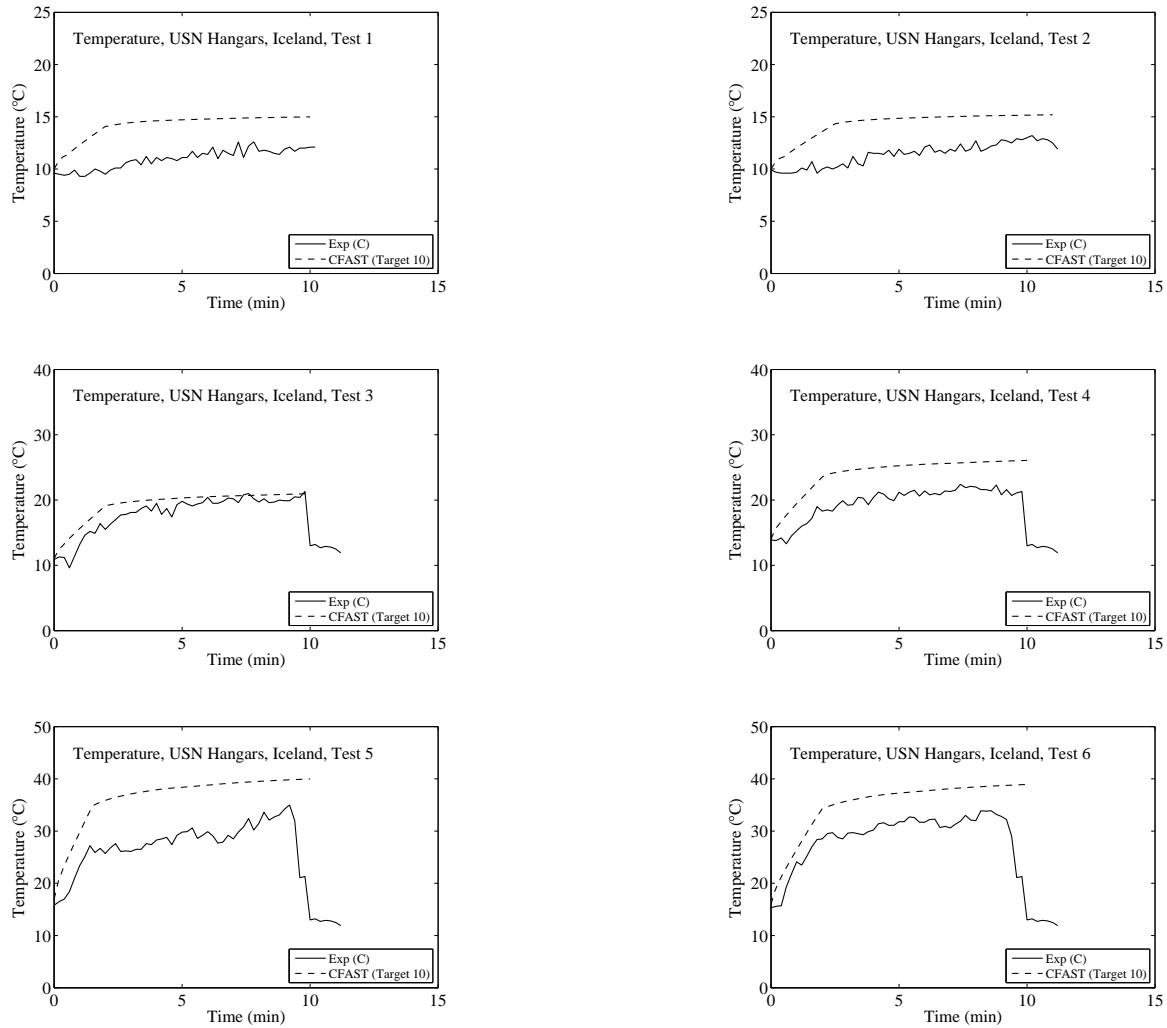
B.11 UL/NIST Vent Experiments



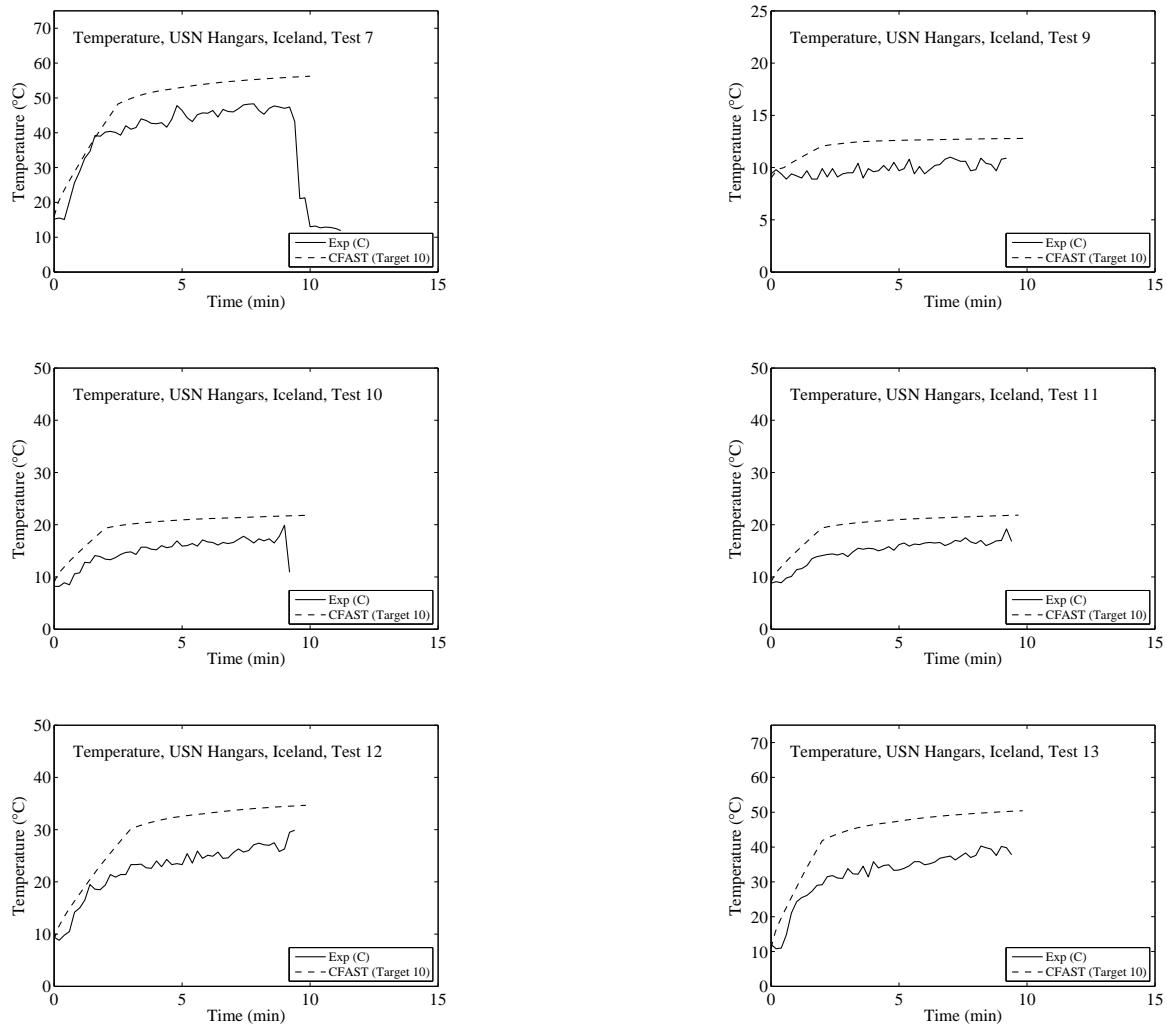
UL/NIST VENT EXPERIMENTS



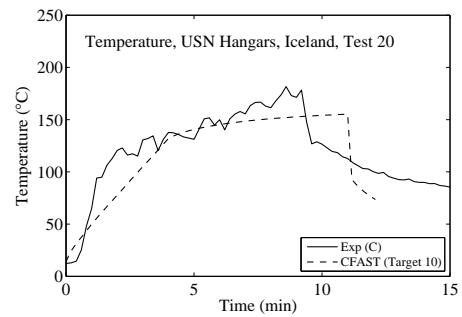
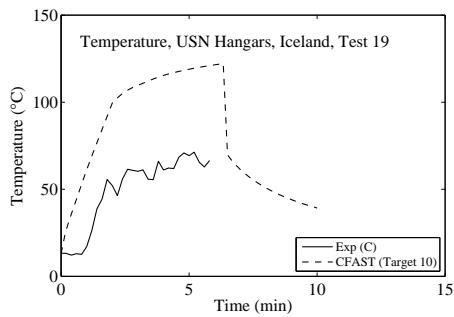
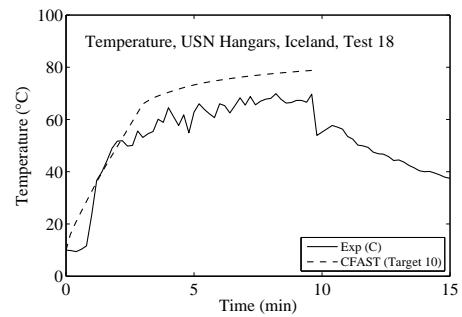
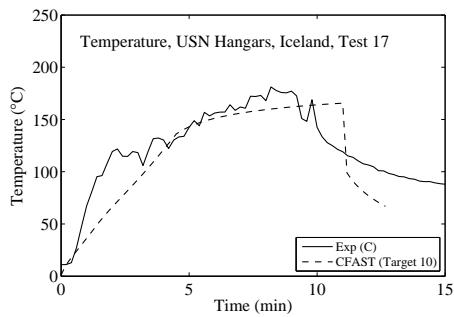
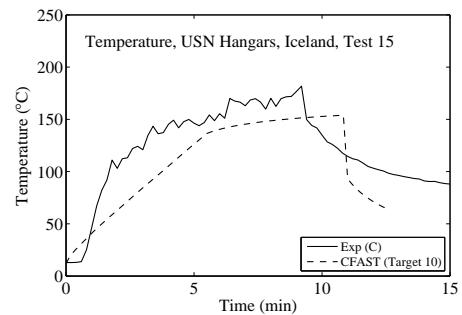
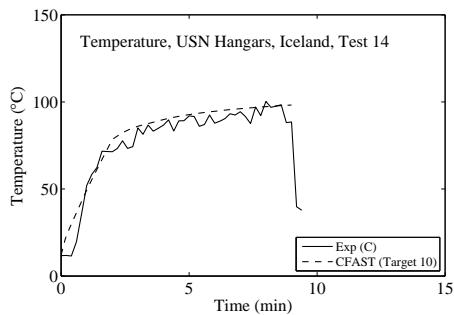
B.12 USN High Bay Hangar Experiments



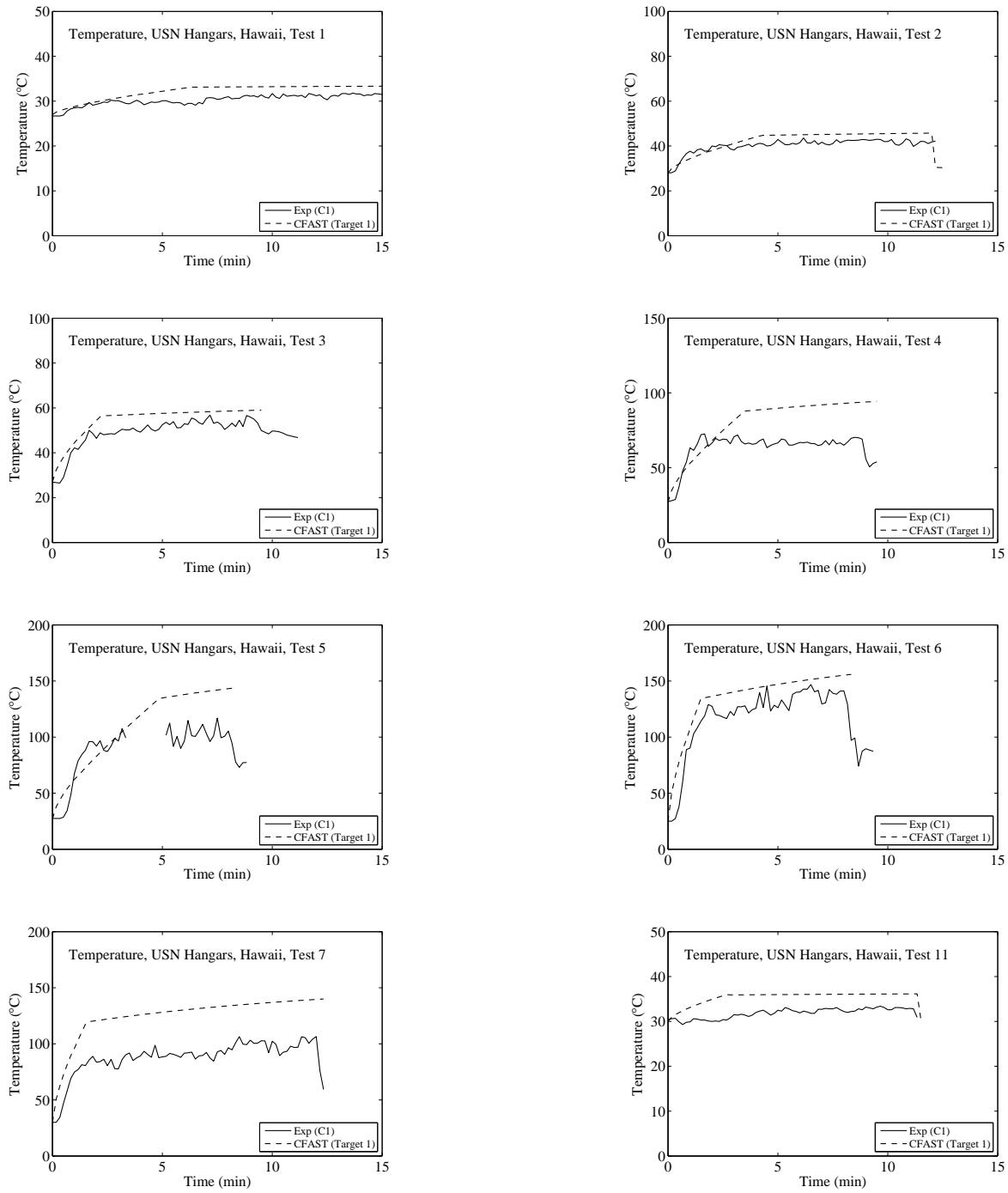
USN HIGH BAY HANGAR EXPERIMENTS



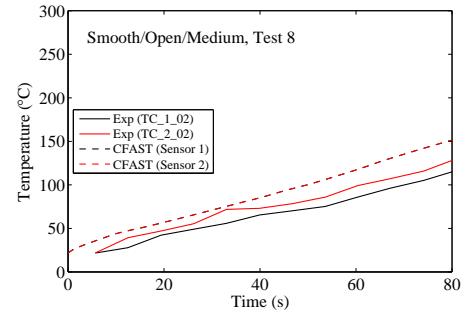
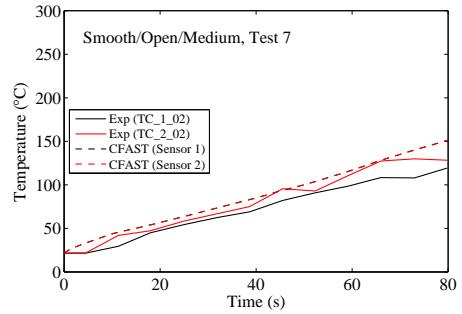
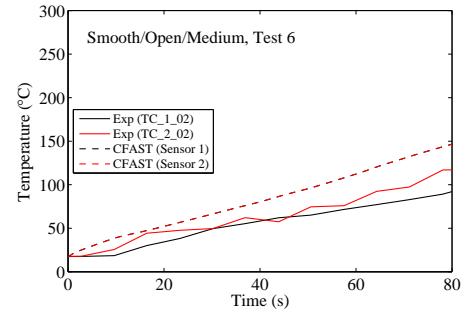
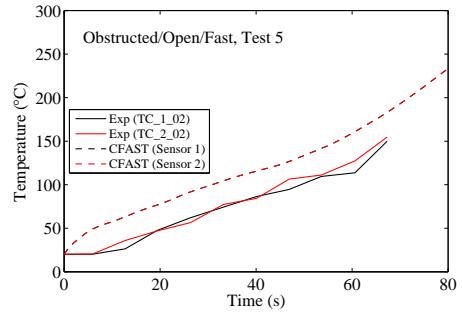
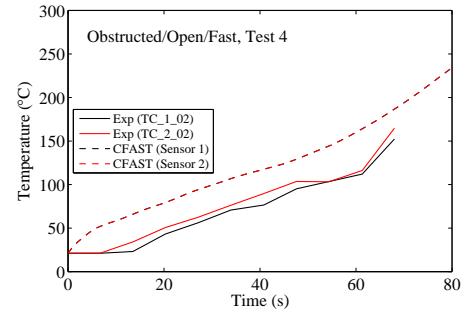
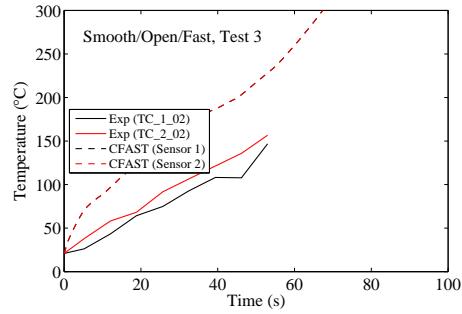
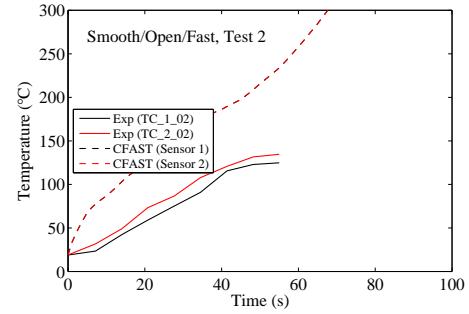
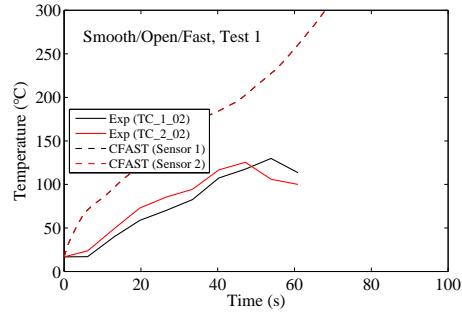
USN HIGH BAY HANGAR EXPERIMENTS



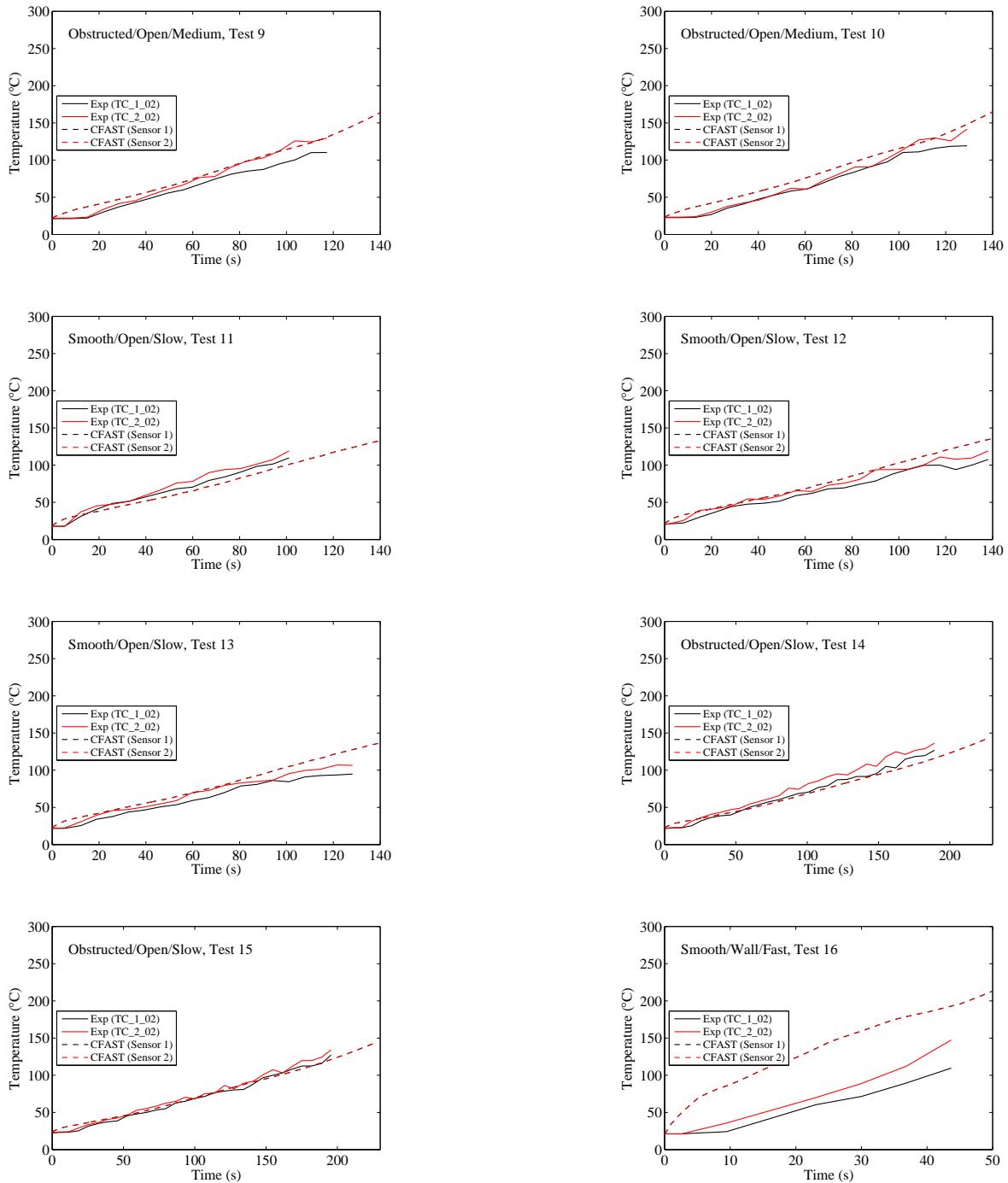
USN HIGH BAY HANGAR EXPERIMENTS



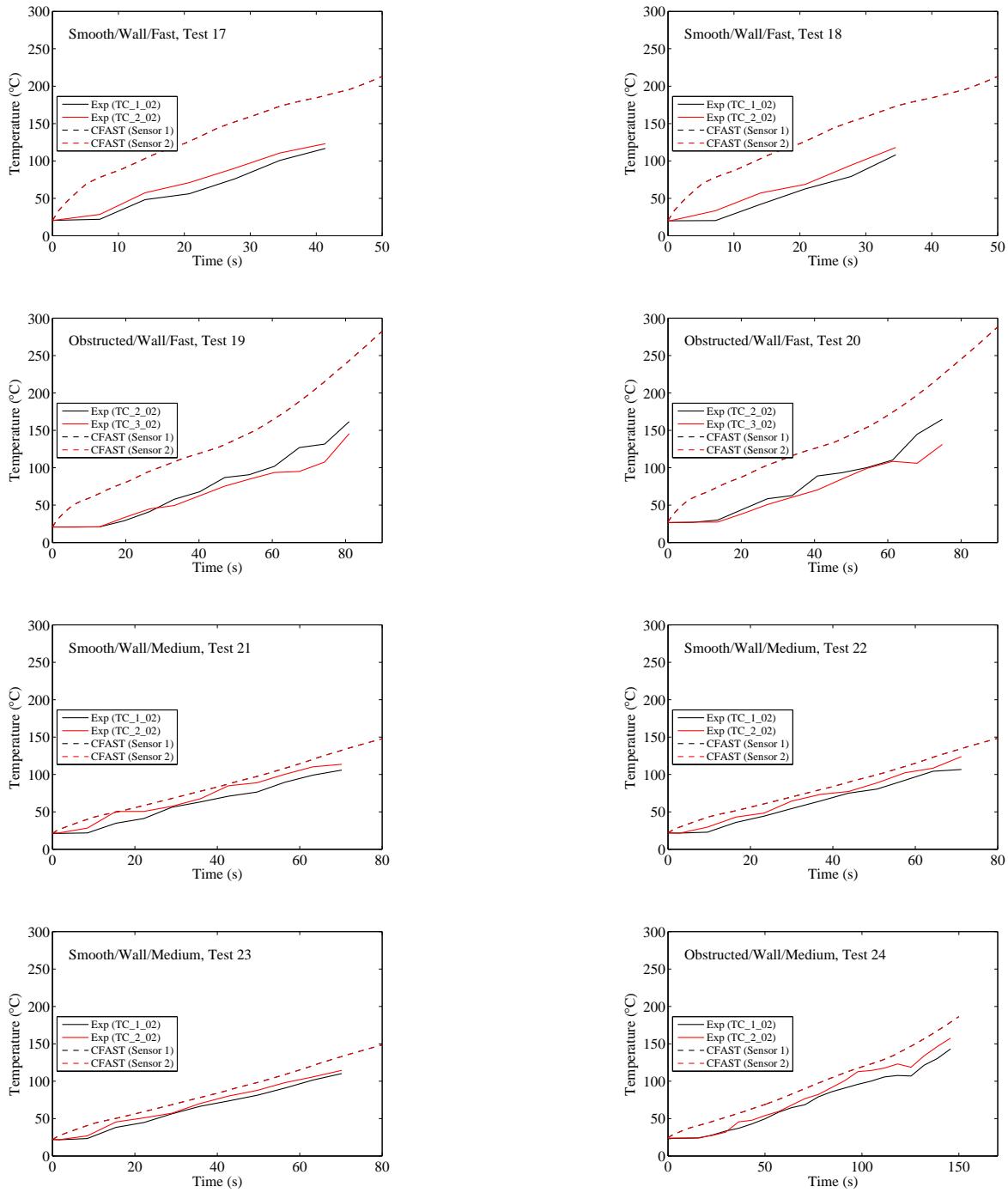
B.13 Vettori Flat Ceiling Experiments



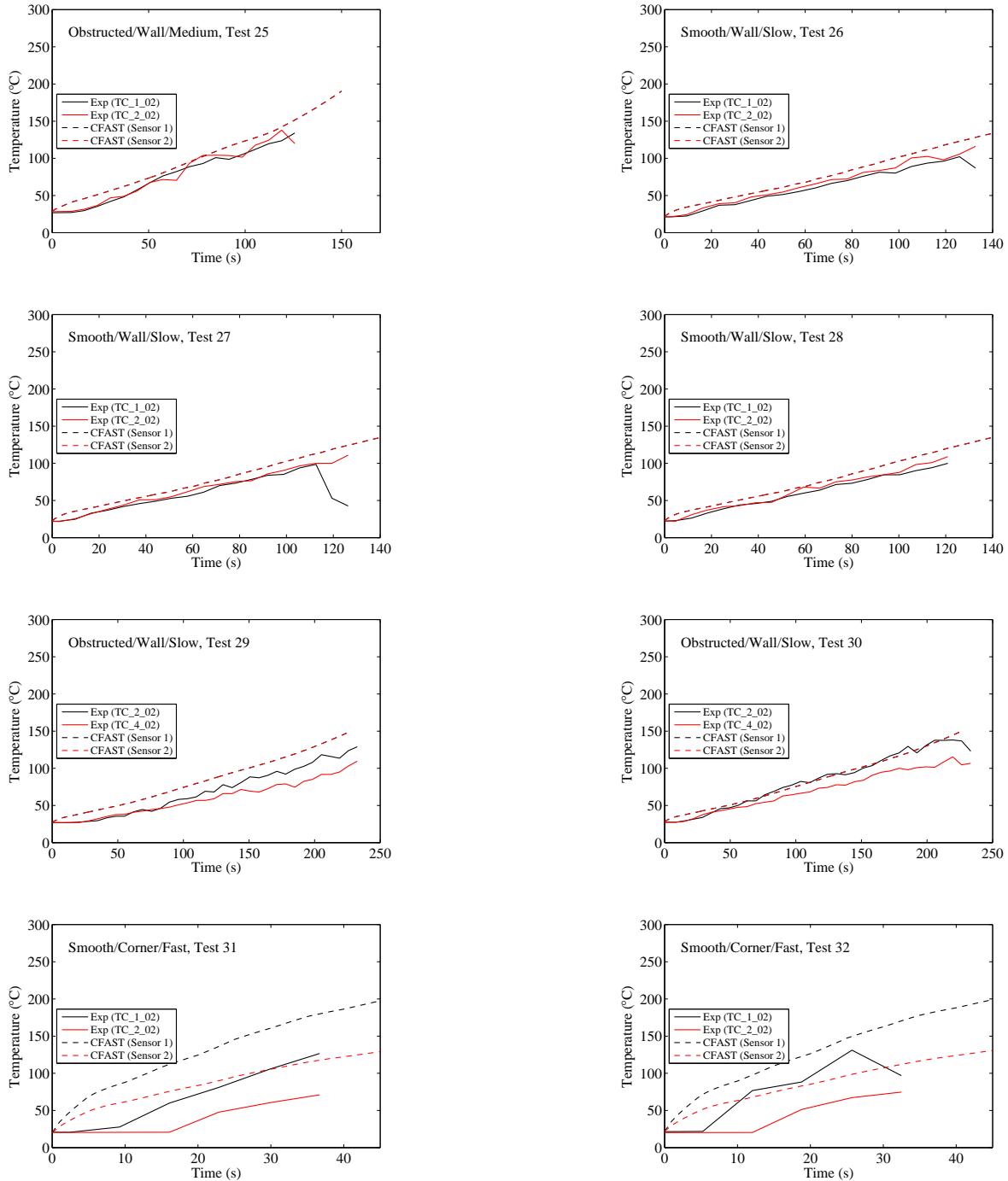
VETTORI FLAT CEILING EXPERIMENTS



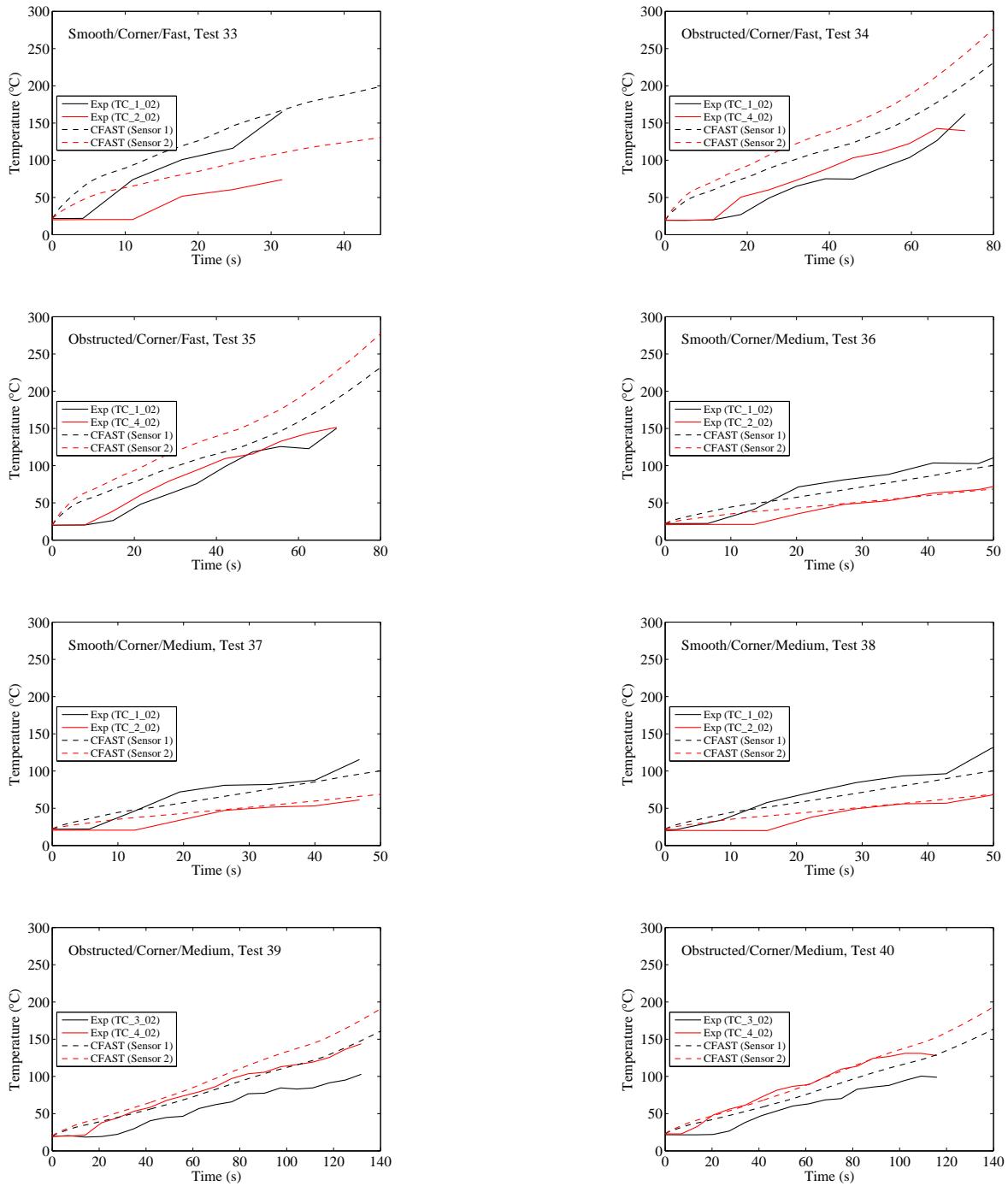
VETTORI FLAT CEILING EXPERIMENTS



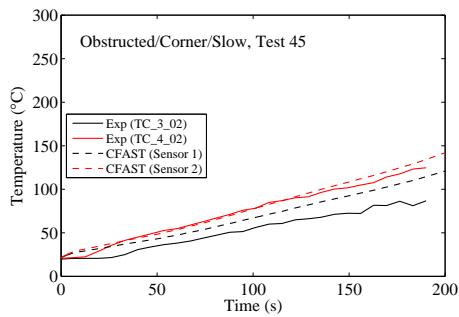
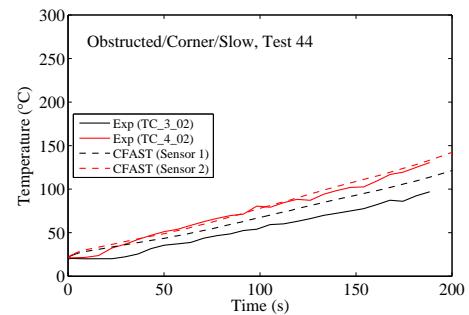
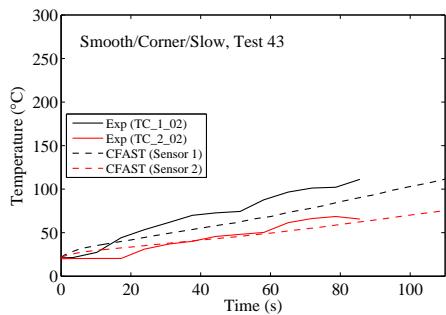
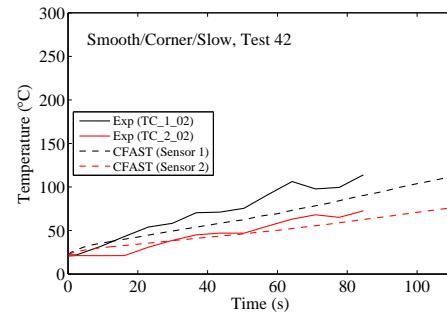
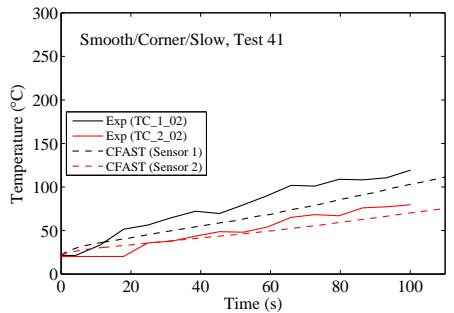
VETTORI FLAT CEILING EXPERIMENTS



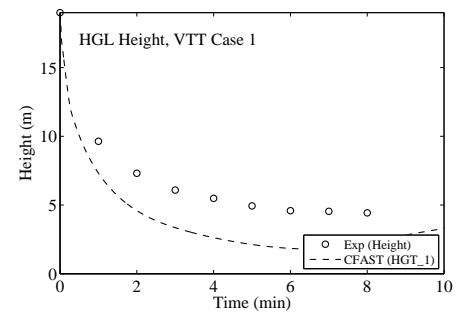
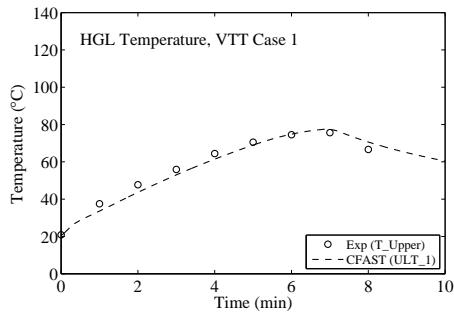
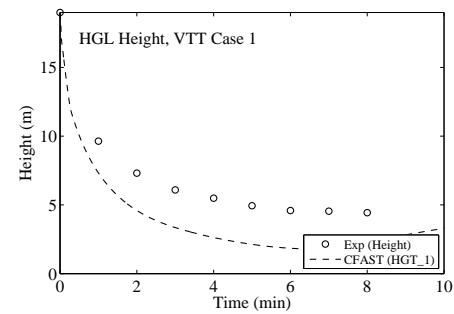
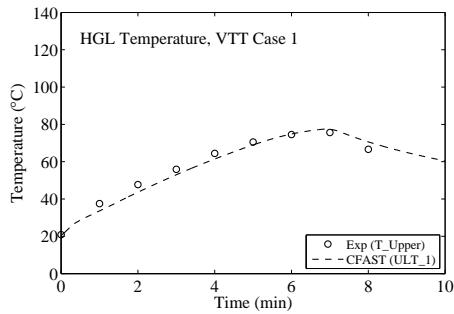
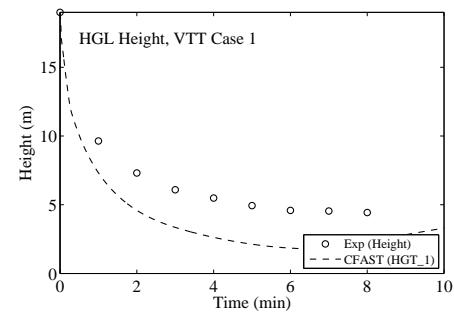
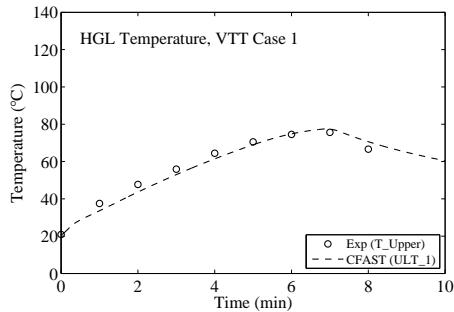
VETTORI FLAT CEILING EXPERIMENTS

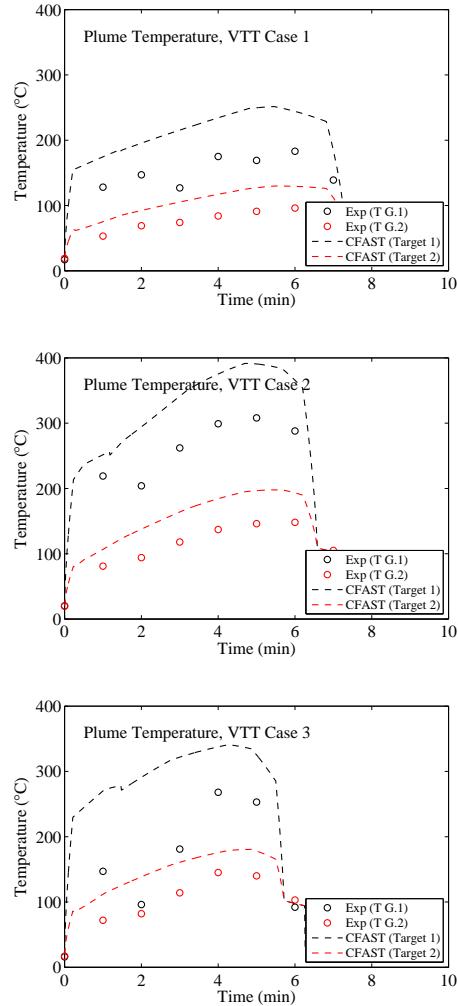


VETTORI FLAT CEILING EXPERIMENTS

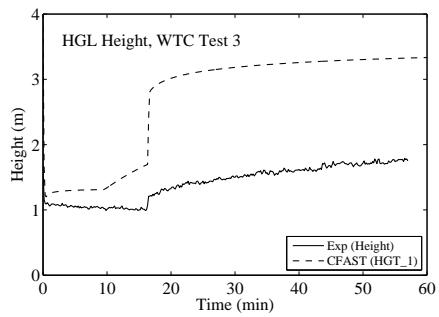
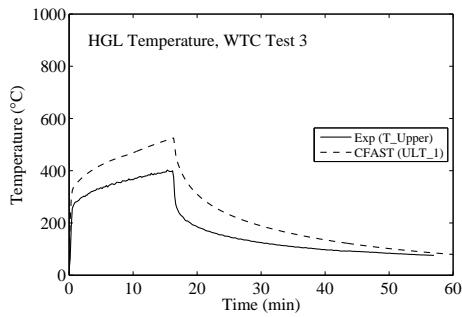
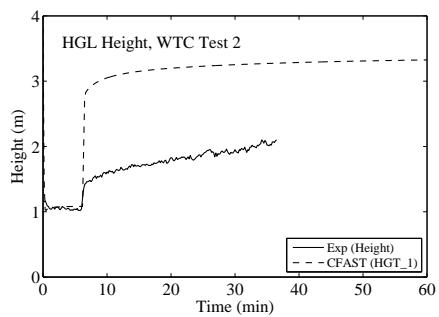
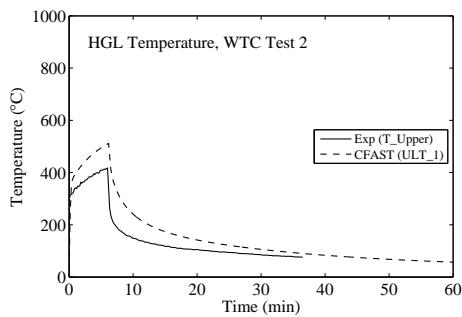
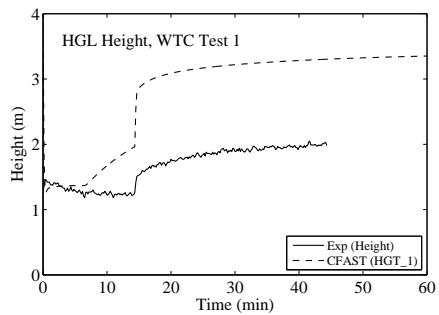
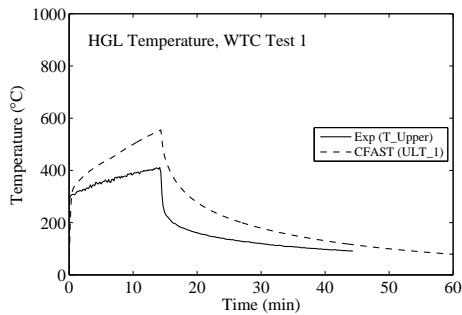


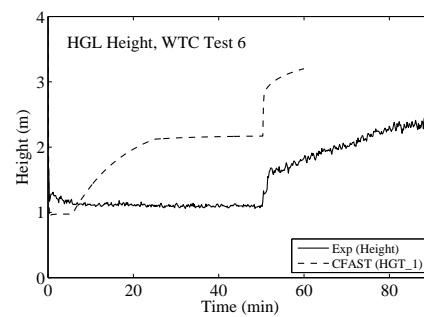
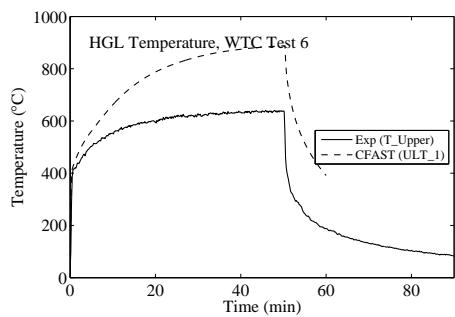
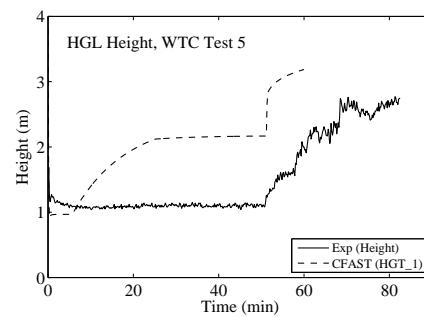
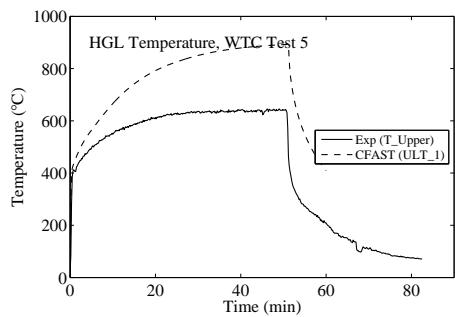
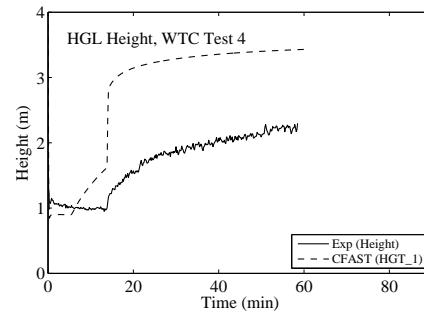
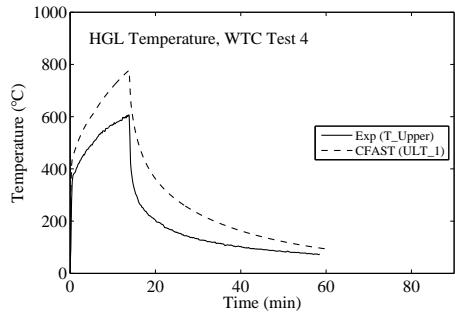
B.14 VTT Large Hall Tests

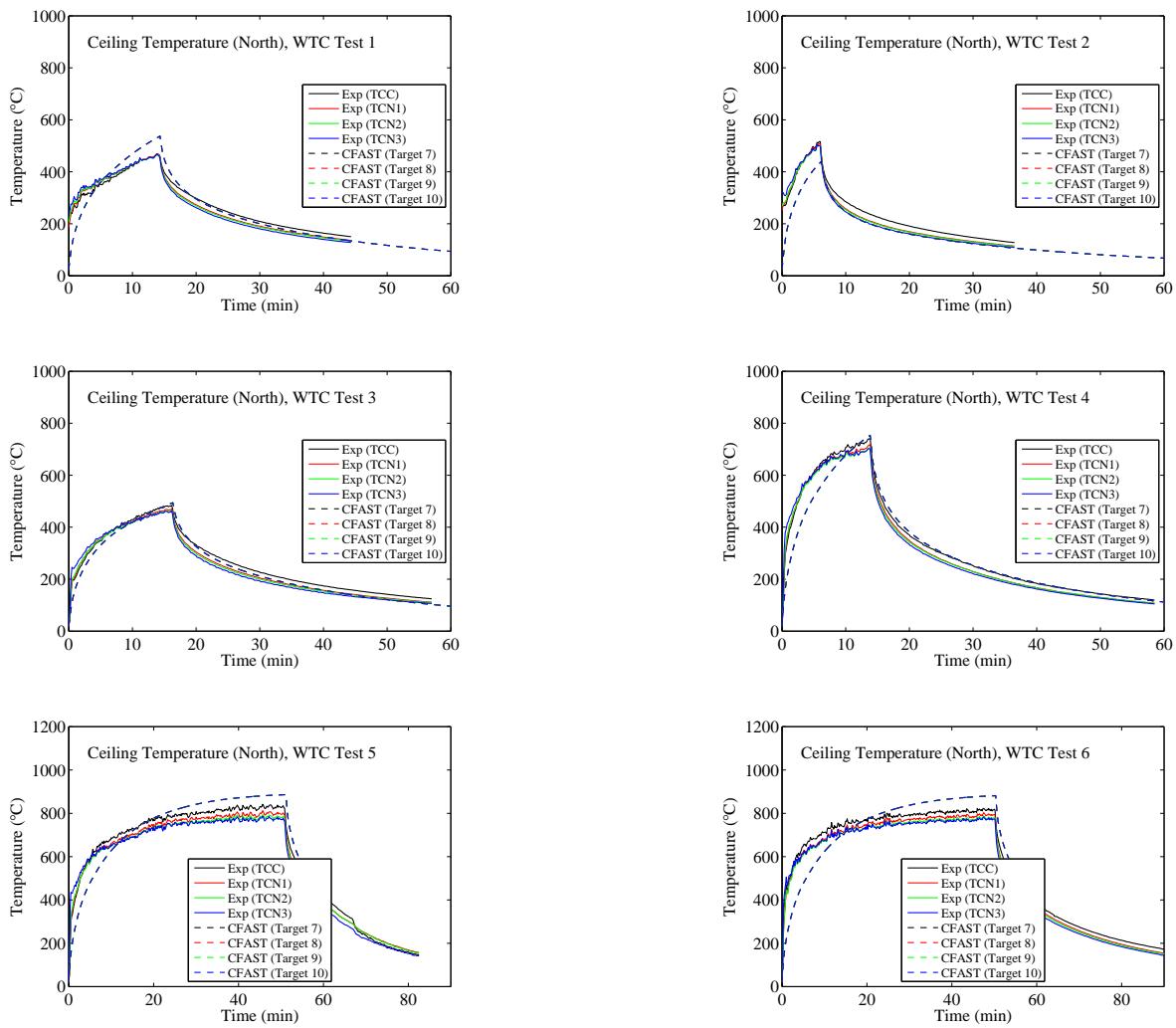


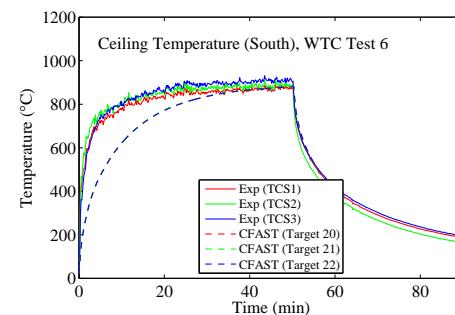
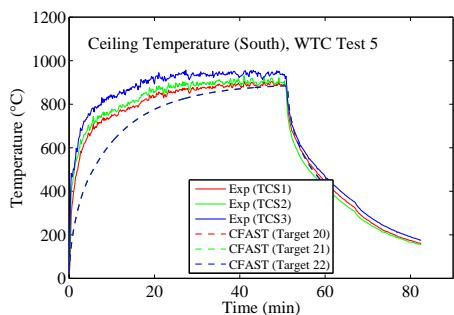
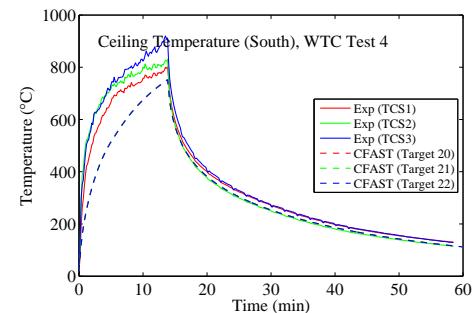
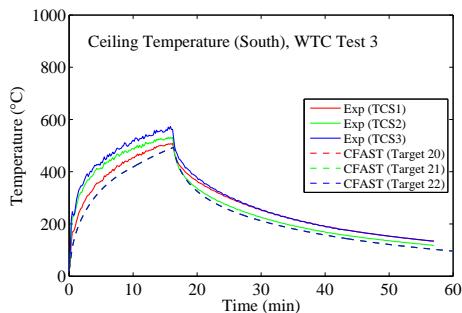
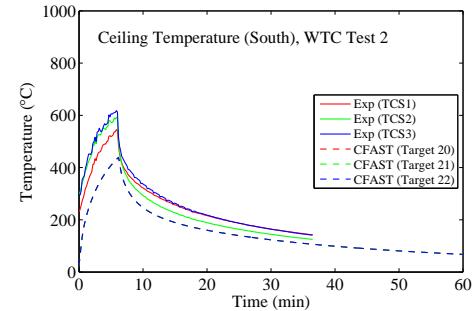
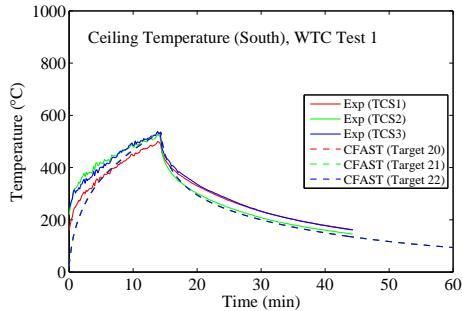


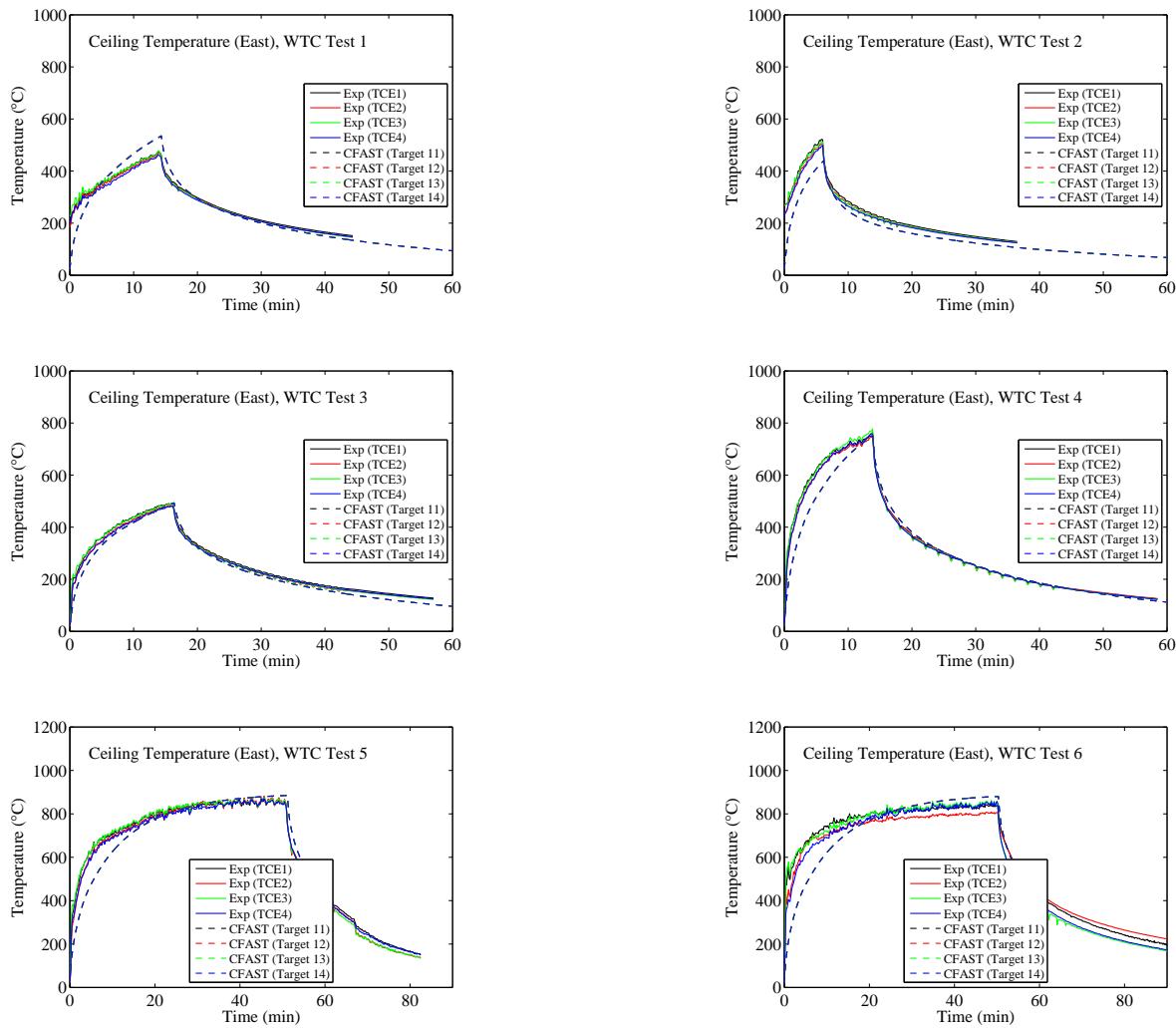
B.15 WTC Test Series

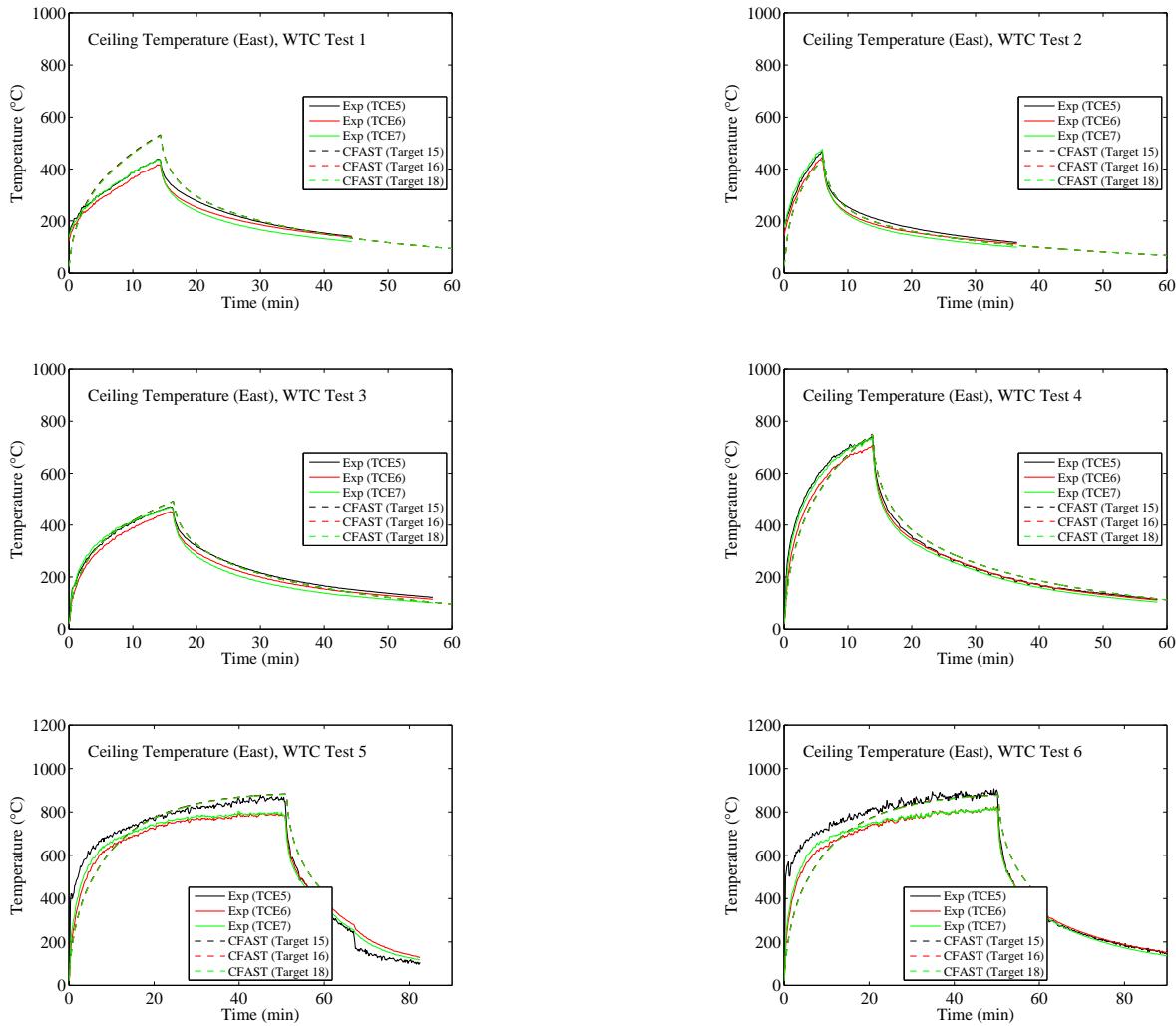


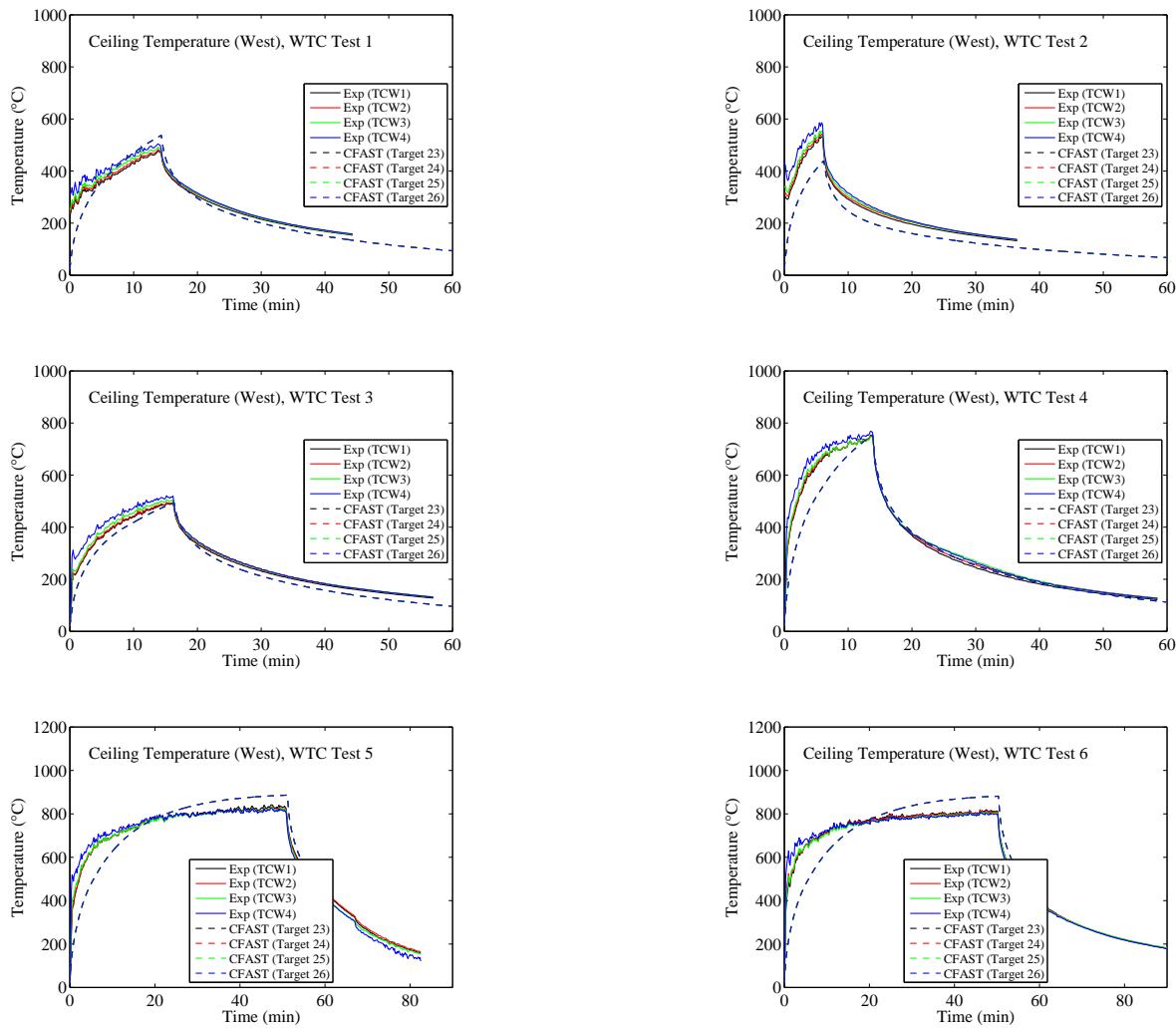


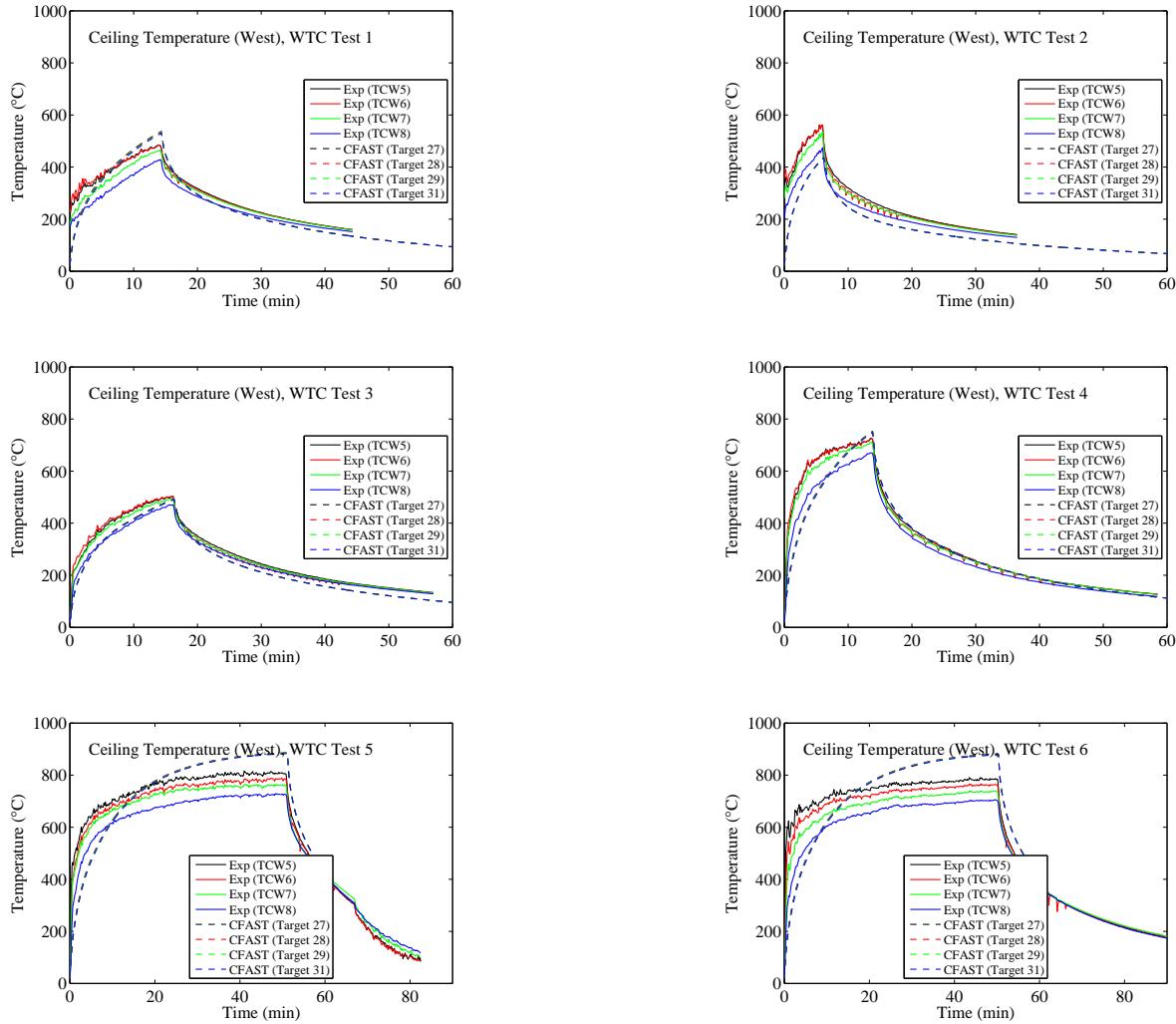


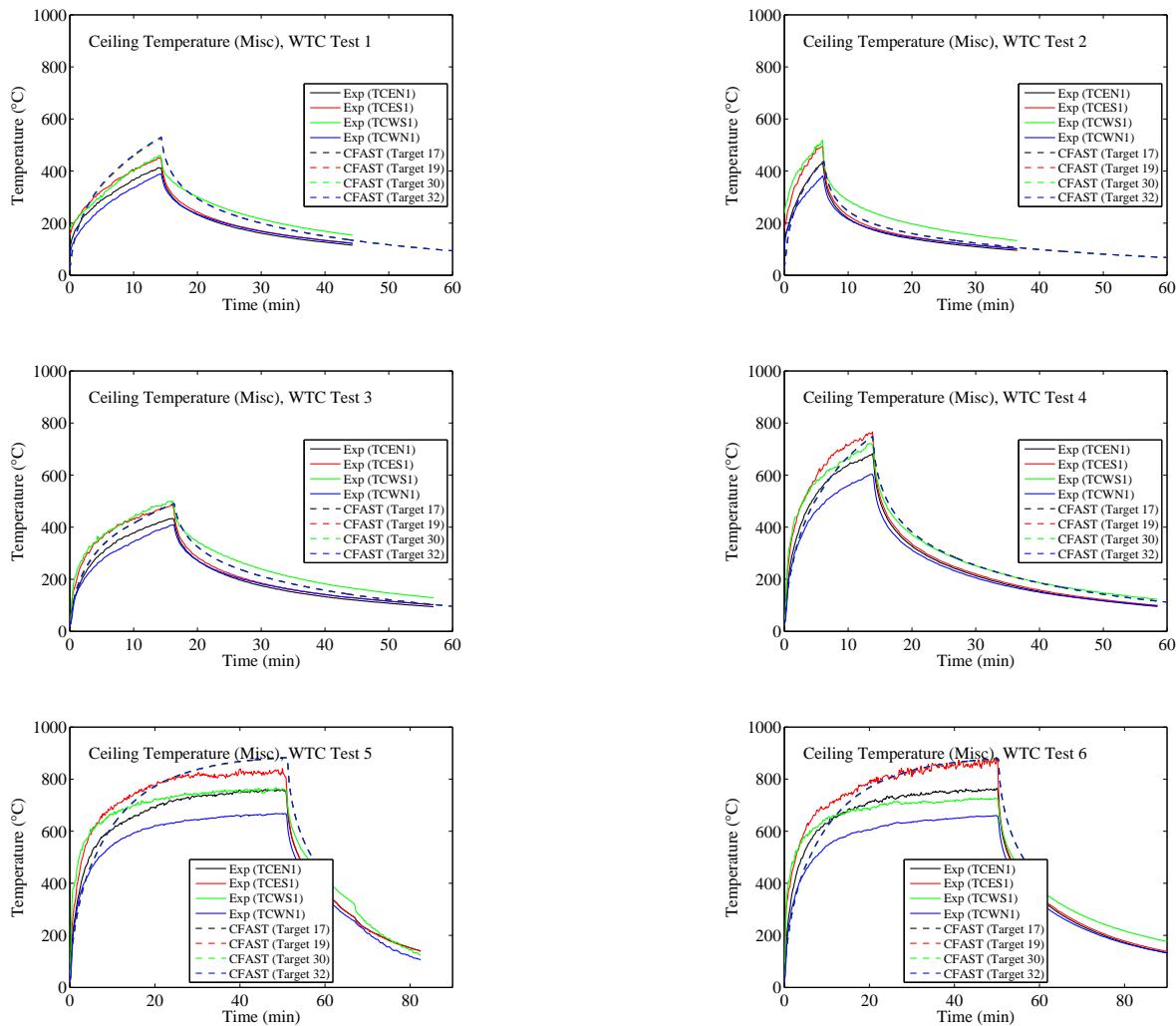


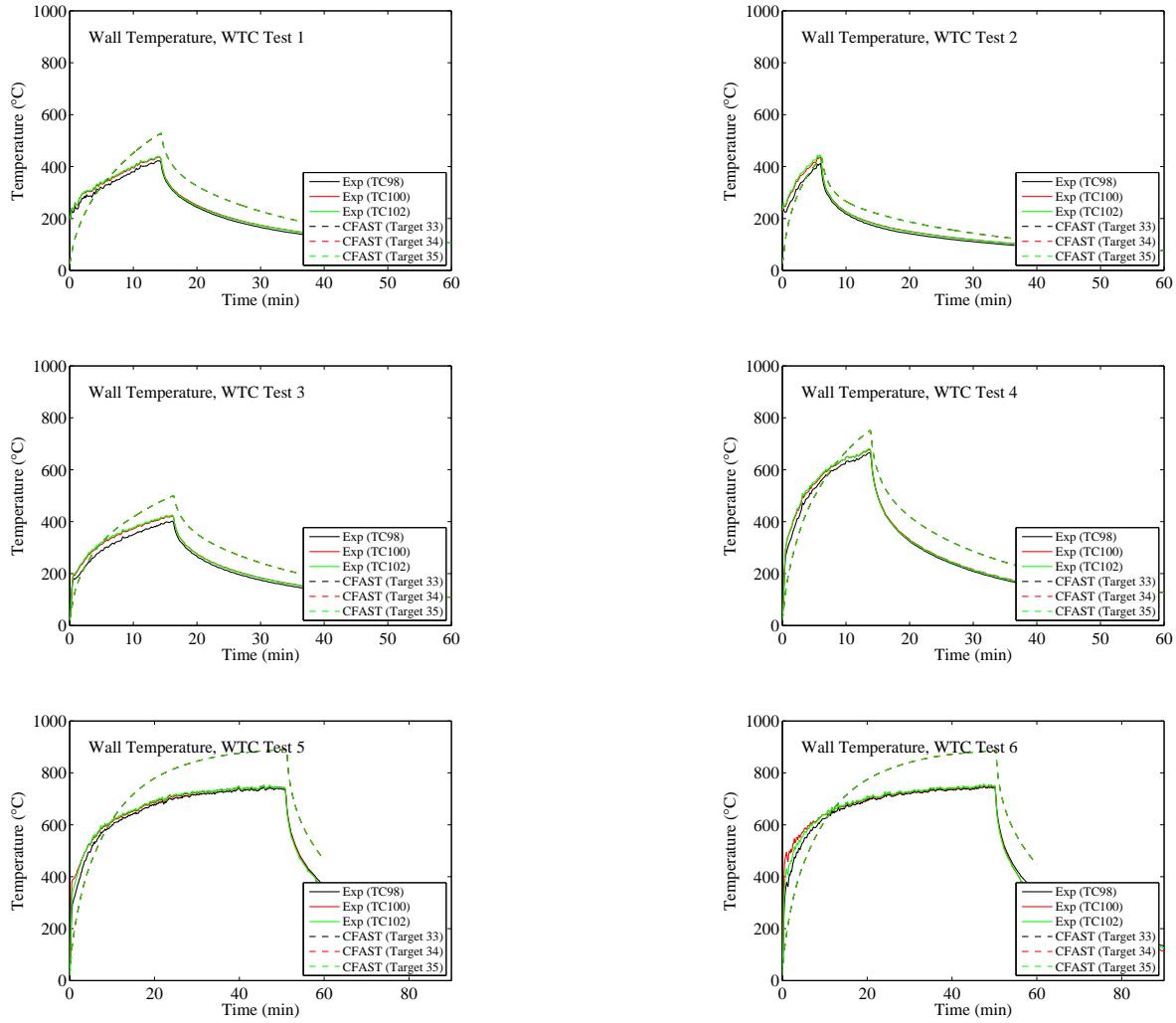


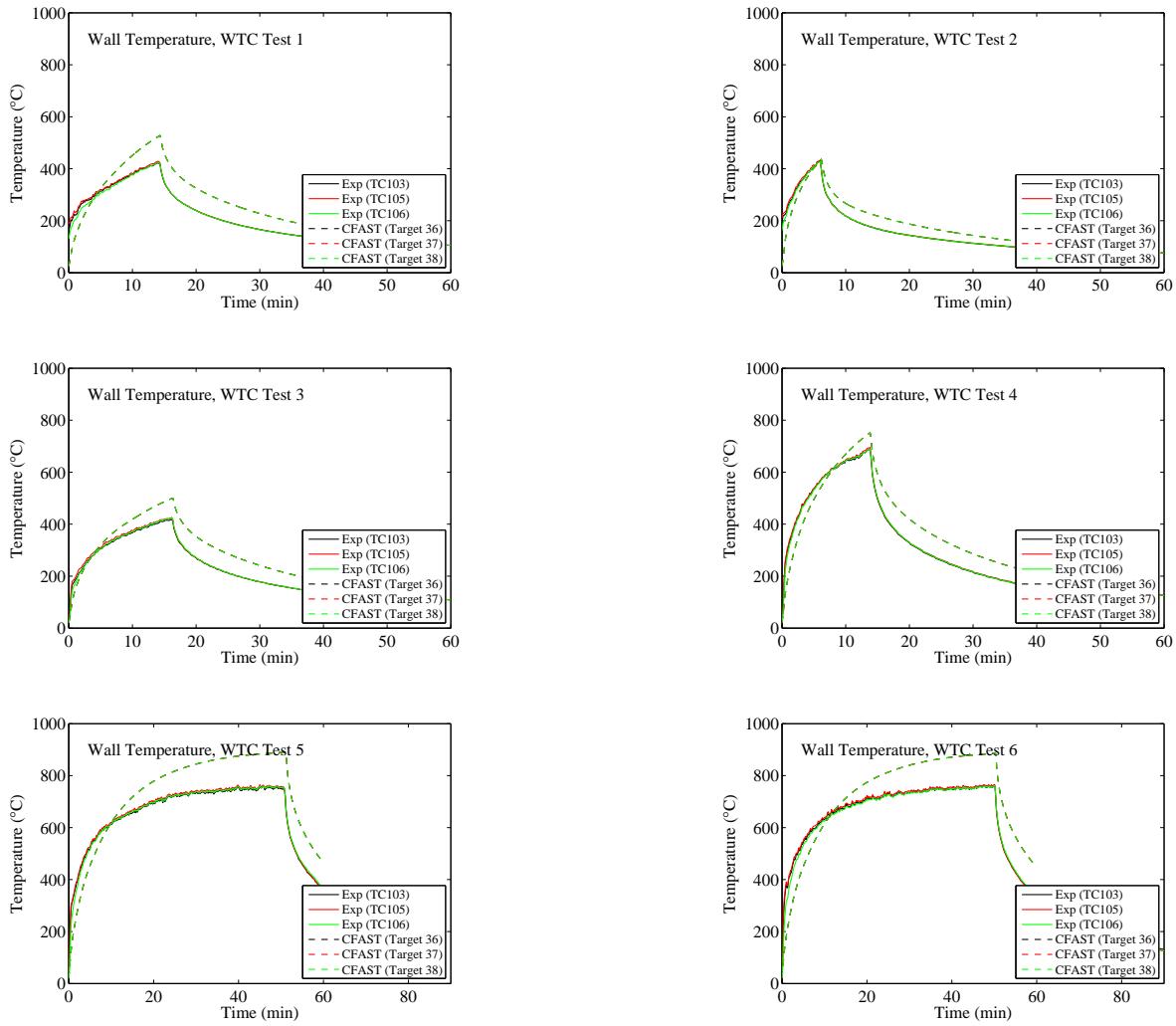


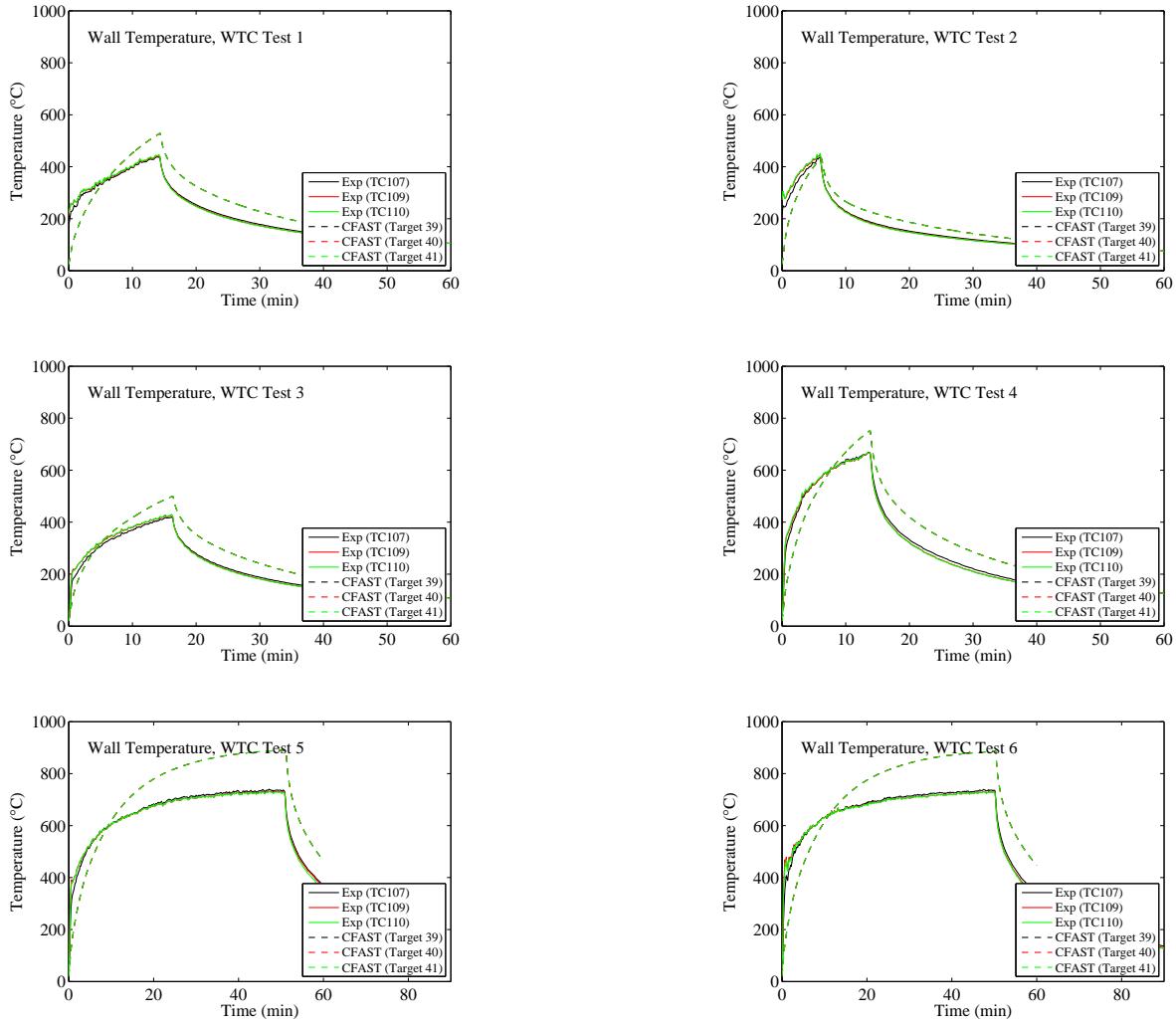


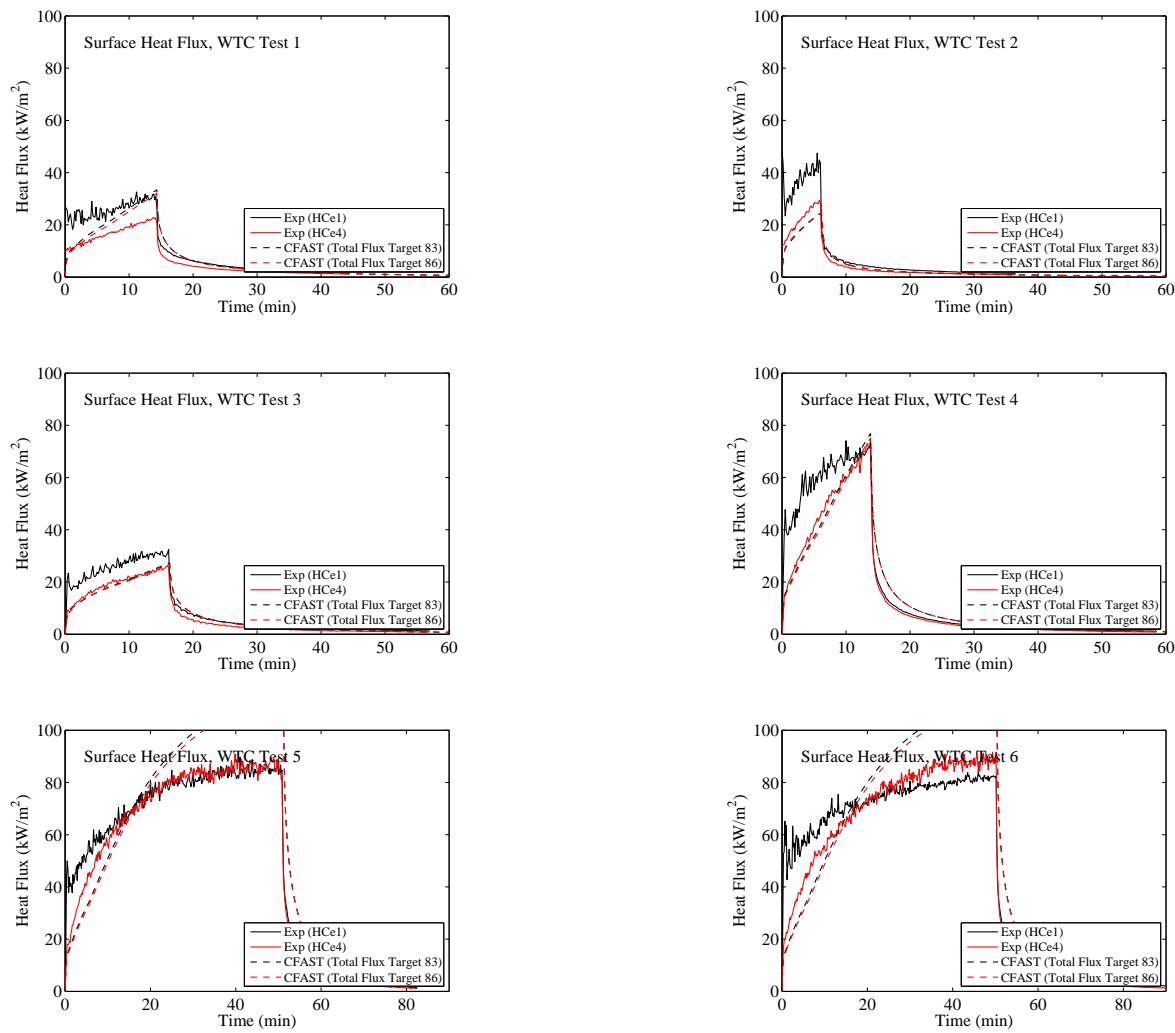


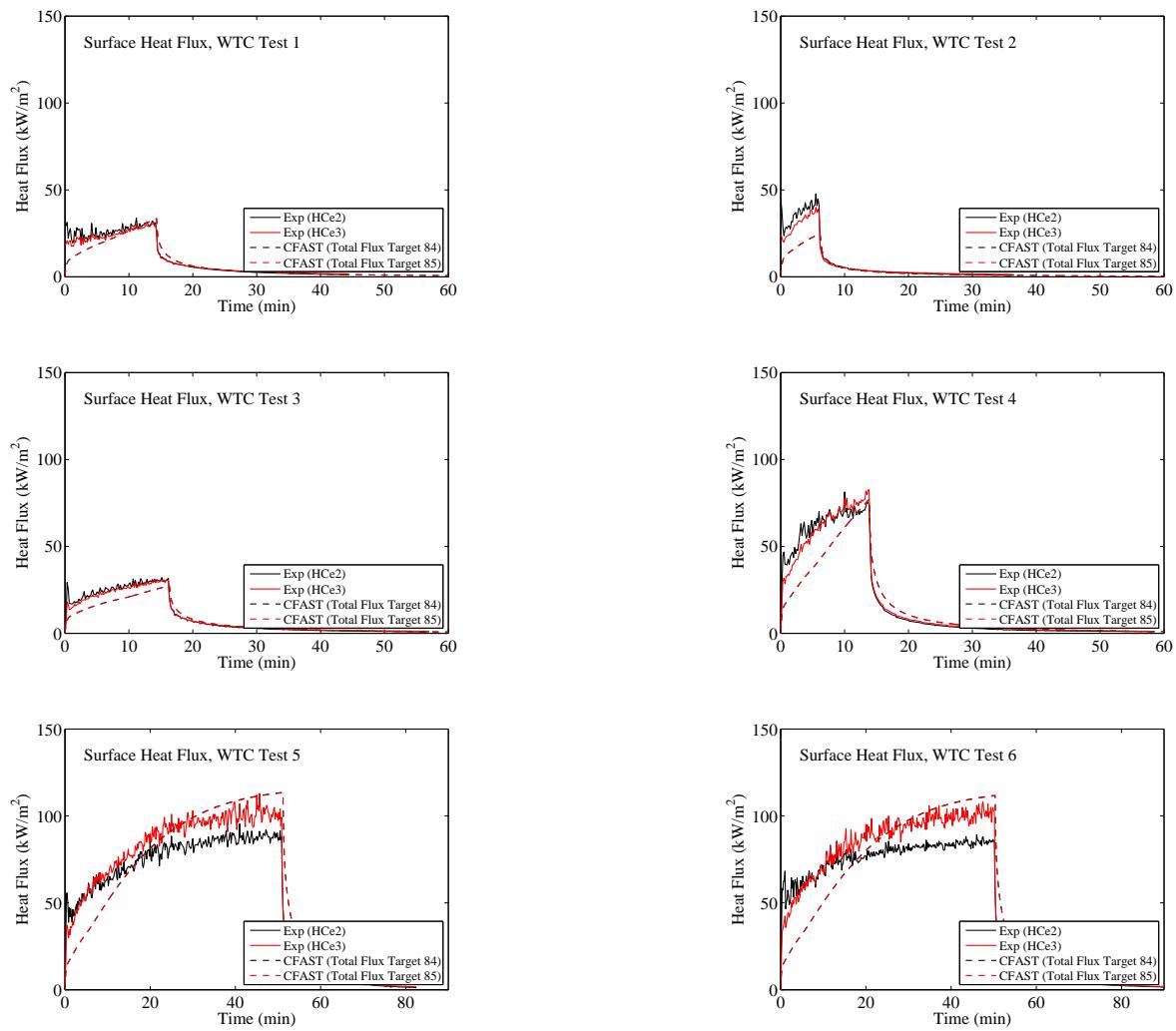


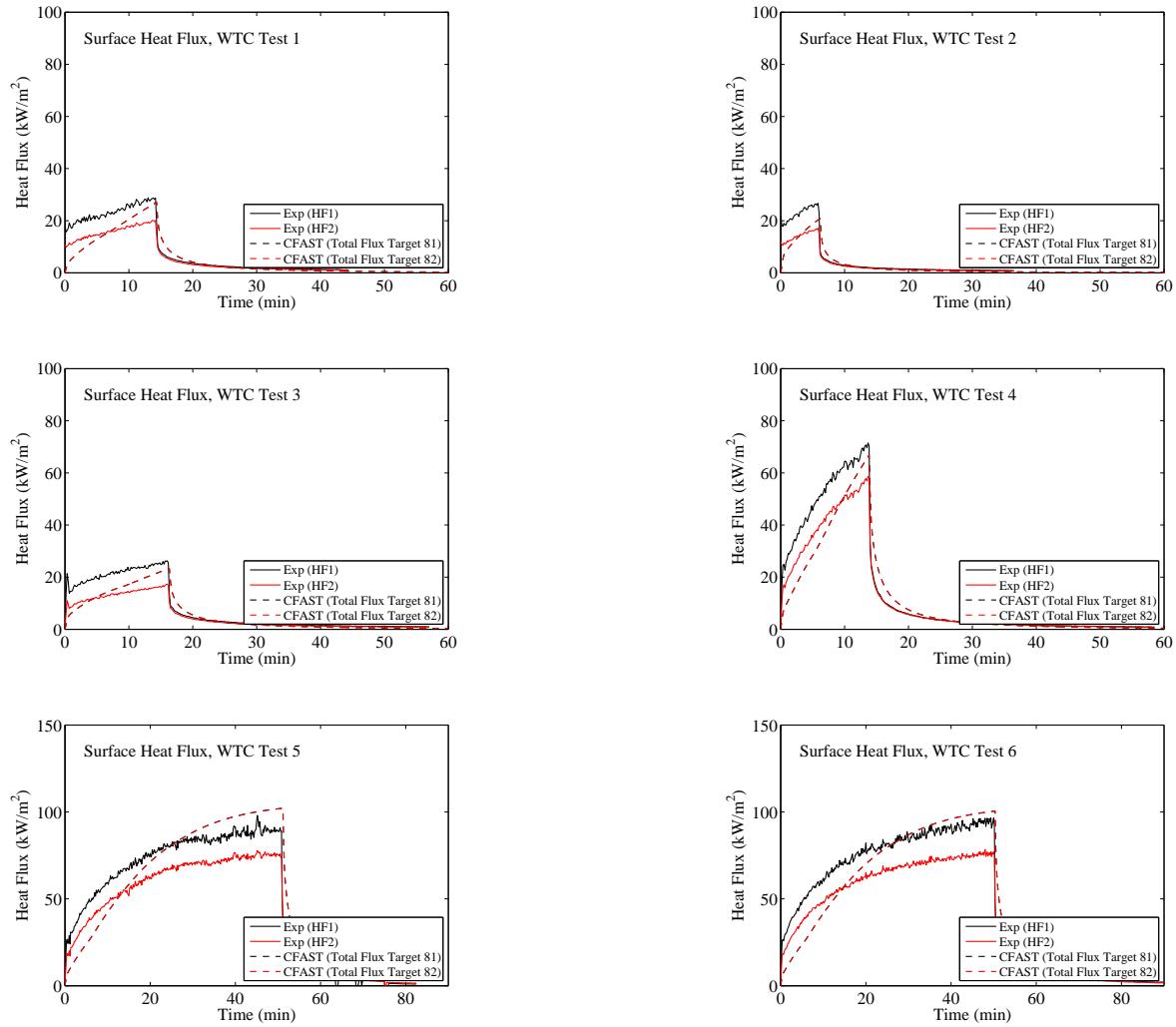












WTC TEST SERIES

