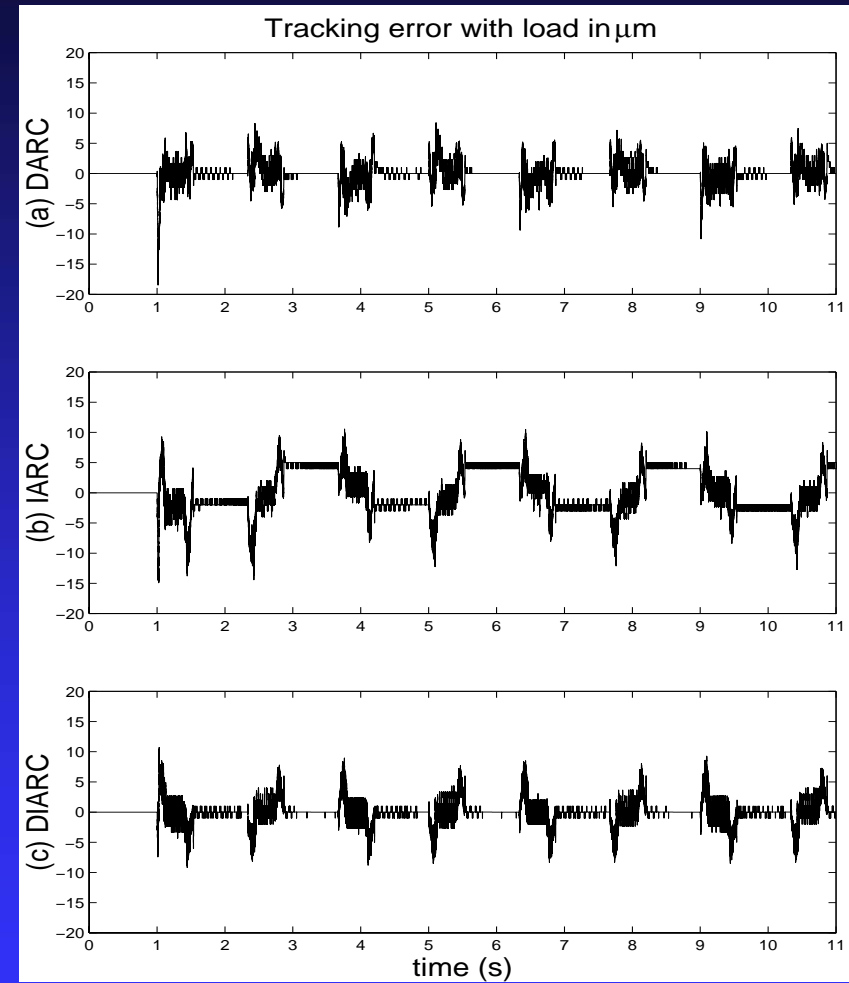# TRACKING ERRORS FOR TYPICAL INDUSTRIAL MOTION
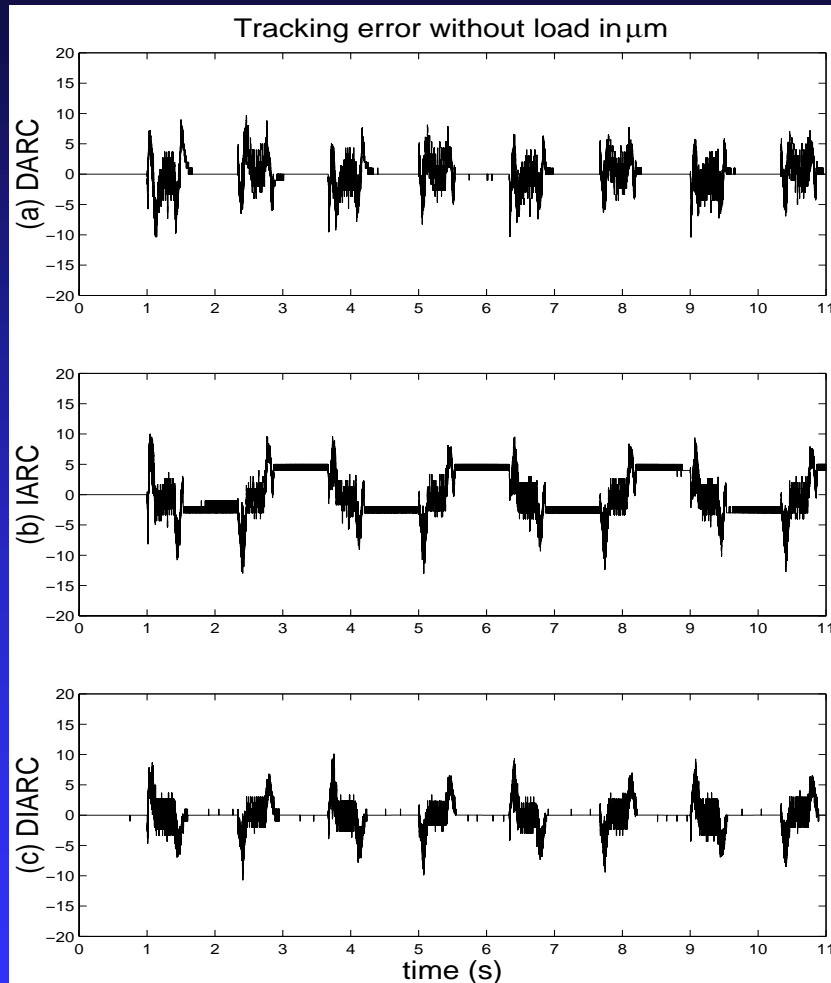## (Point-to-Point with Velocity of 1m/sec and Acceleration of 12m/sec²)

Tracking error without load in μm

Tracking error with load in μm

The above results demonstrate the excellent robust tracking performance of the proposed ARC algorithms – Tracking errors are mostly within 10 micrometers with final tracking error around the encoder resolution of 1 micrometer for both loaded and unloaded cases
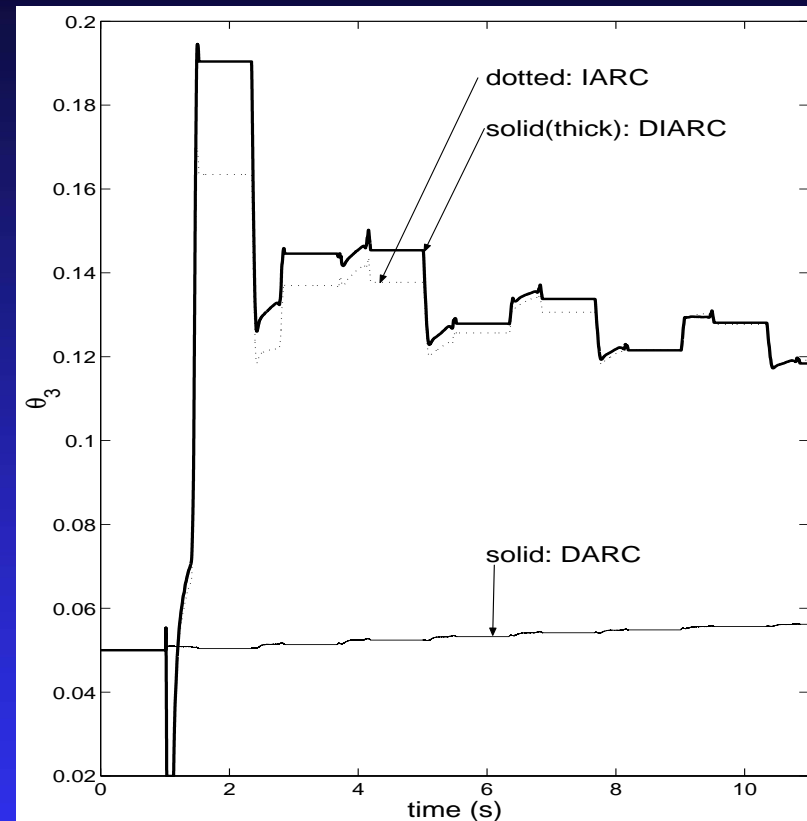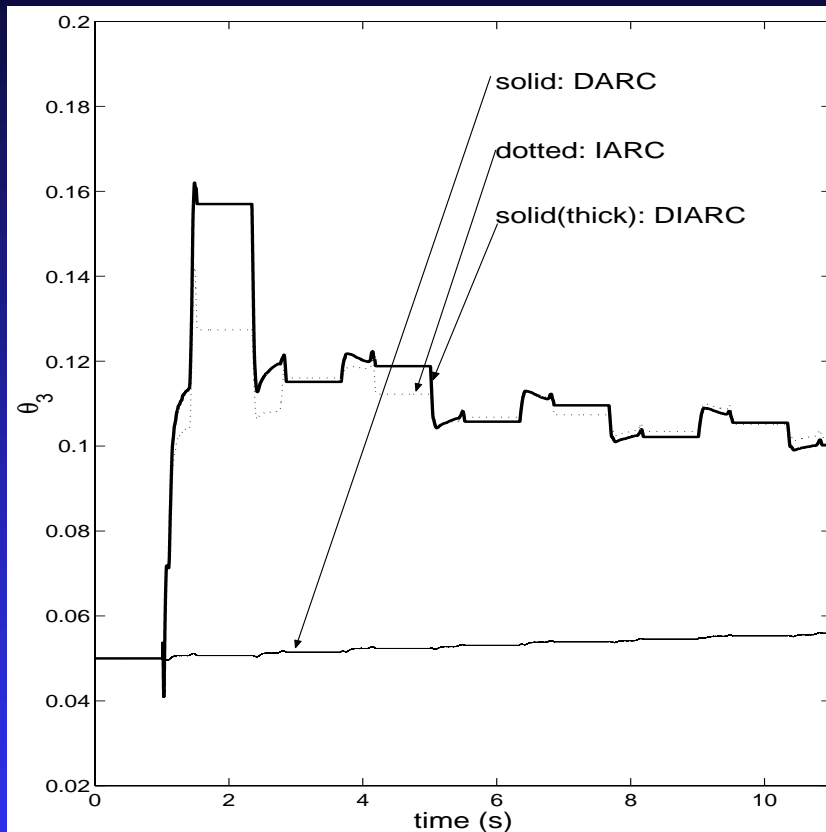
ON-LINE INERTIA ESTIMATES
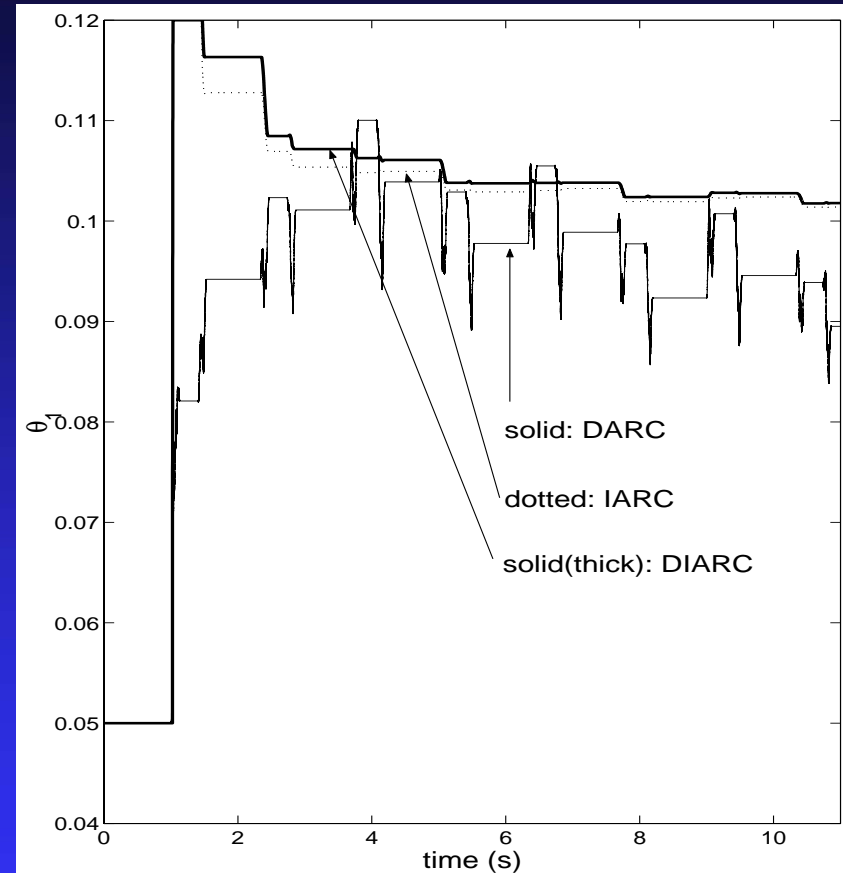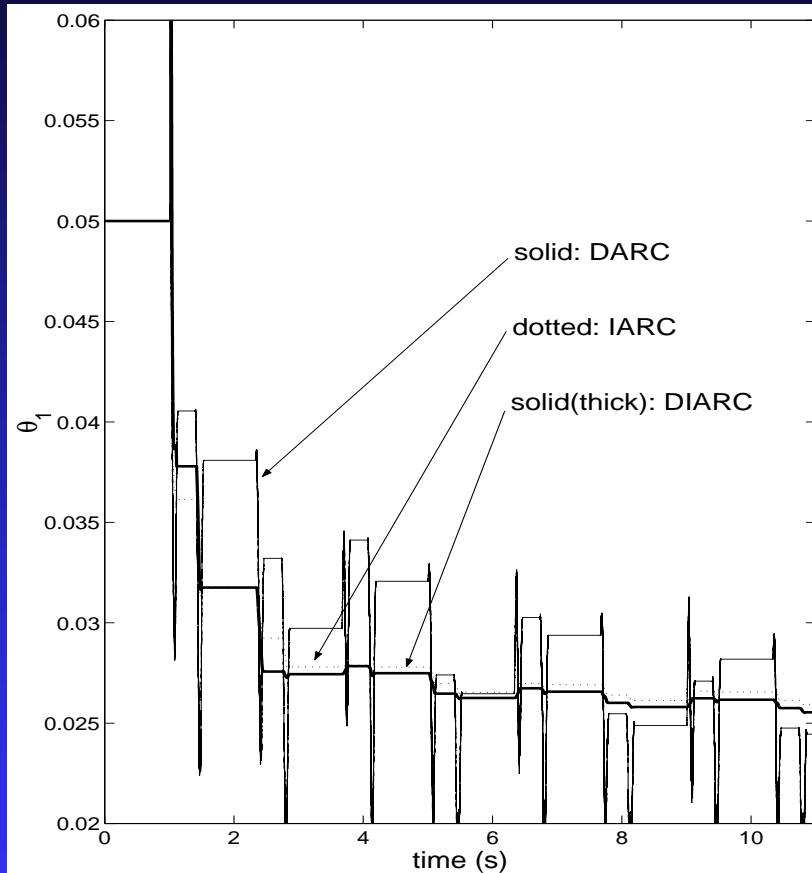
The above plots show the accurate parameter estimation capability of the proposed DIARC and IARC – estimates of the inertia load converge to their actual values for both loaded and unloaded cases

⟹ Non-Conservative Task Planning and Controller Gain Tuning

ON-LINE FRICTION ESTIMATES

On-line estimates of the Coulomb friction converge to their actual values for both loaded and unloaded cases

⟹ Features like prognostics, machine health monitoring, fault detection, etc, can be added when one knows the time history of certain critical parameters (e.g., accurate friction estimate can be used to schedule service of the motor on-demand)