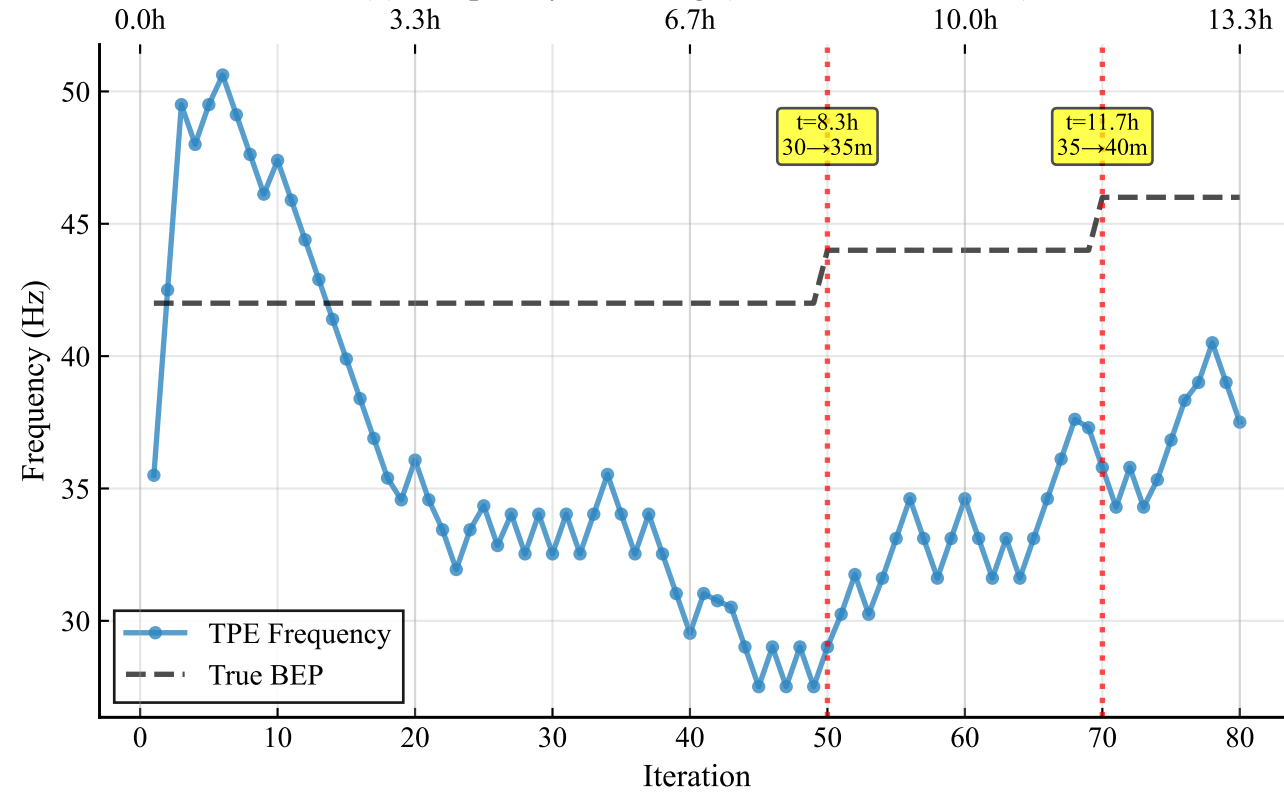
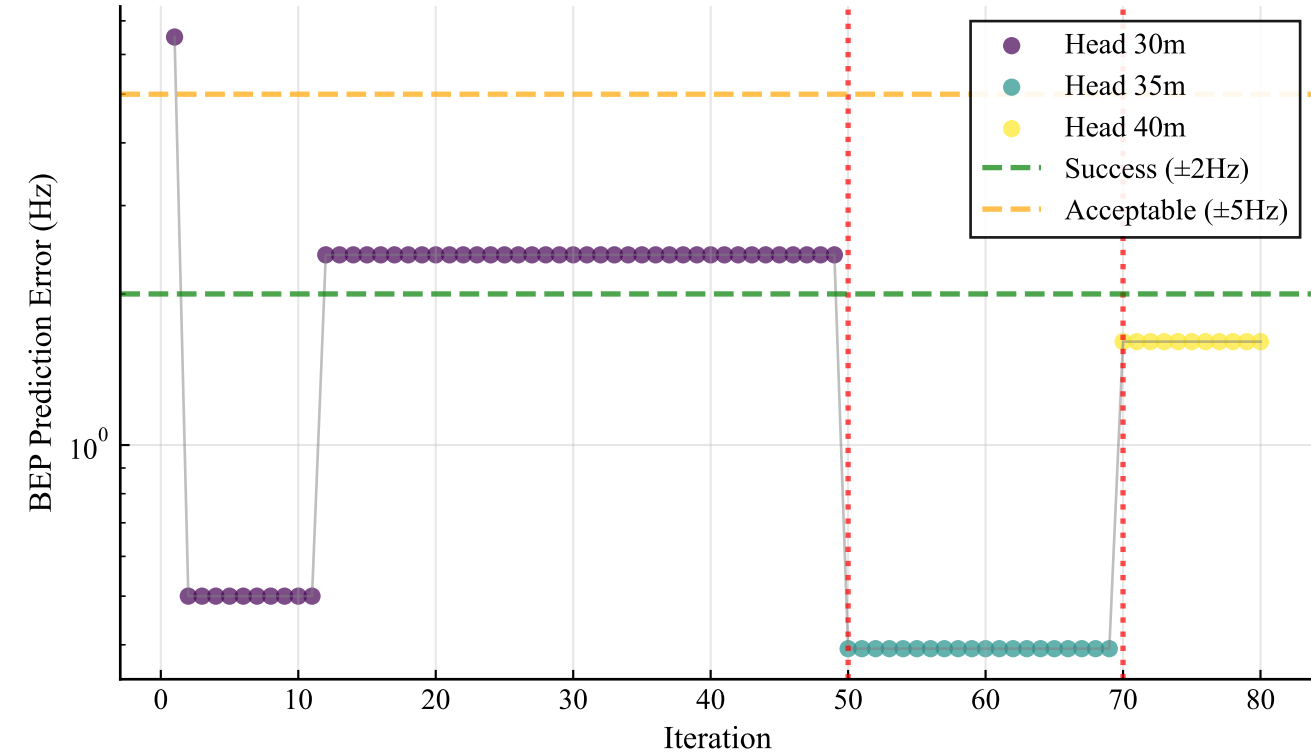


TPE Performance Under Dynamic Head Changes

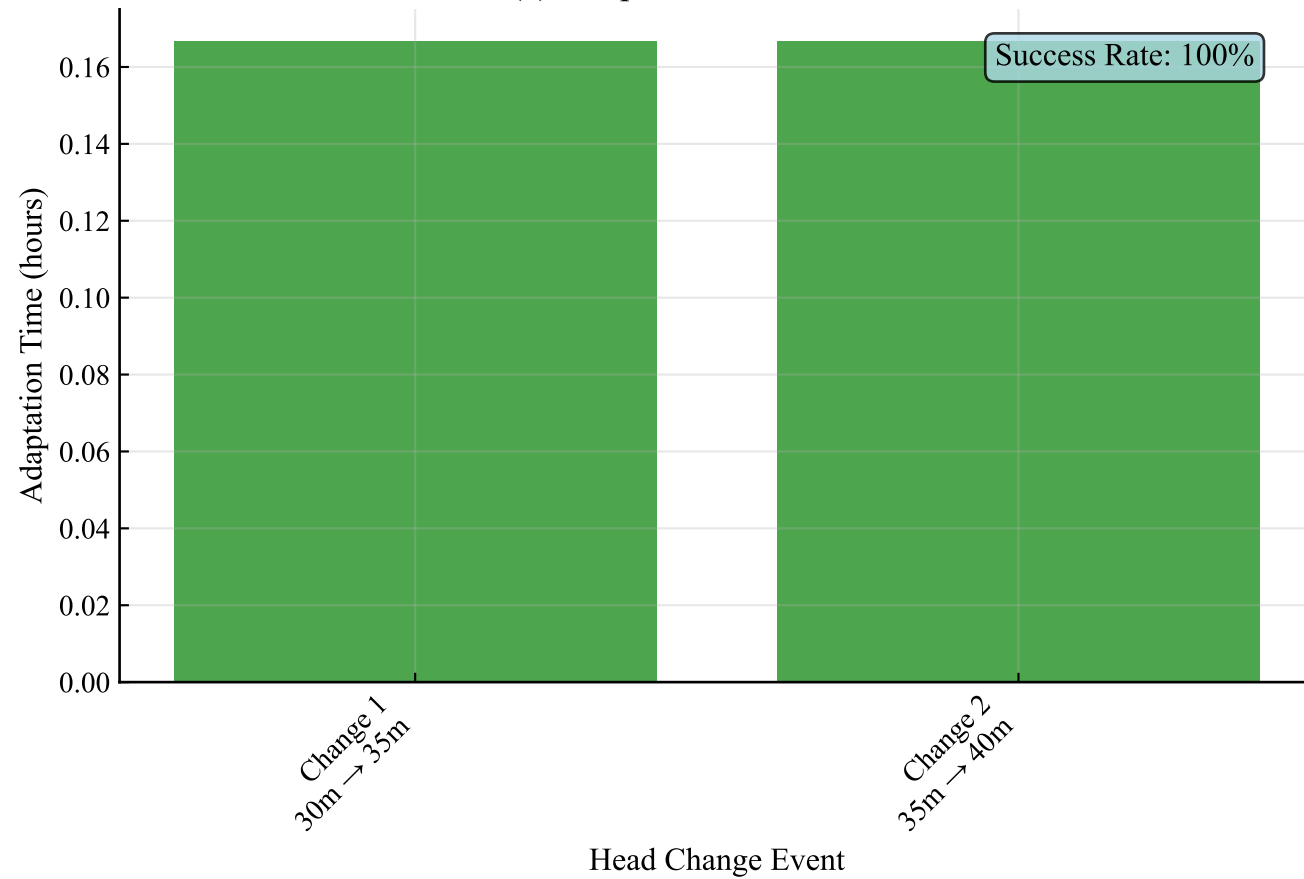
(a) Frequency Tracking (10-minute intervals)



(b) Error Evolution



(c) Adaptation Performance



(d) System Head Timeline

