Joint Spatio-Temporal Bias Estimation and Tracking for GNSS-Denied Sensor Networks

The Problem

Sensor calibration for reliable object tracking without a <u>global frame of reference</u> (e.g. GPS).

The Proposed Solution

<u>Grid-based search</u> method with <u>likelihood function</u> to test the bias state space.

The Simulation

<u>Single nearly constant velocity object</u> tracked by two radars: one acts as reference. <u>Measurement noise</u> (σ_R) and <u>process noise intensity level</u> ($\tilde{q}$) varied.
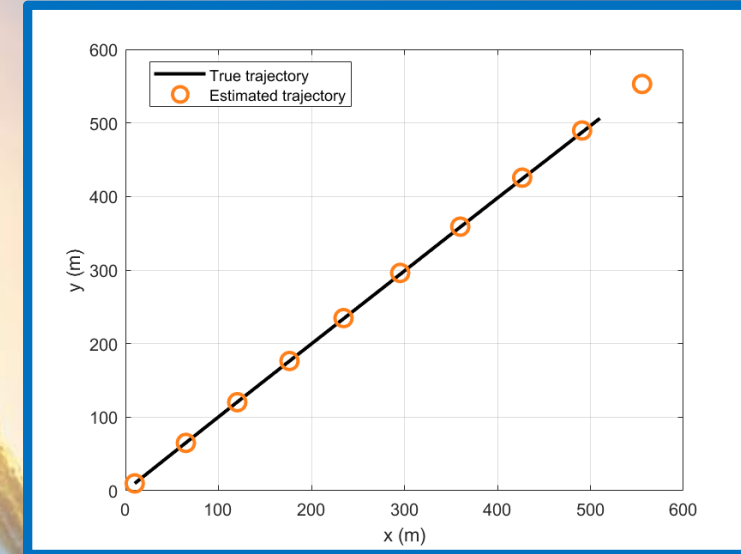
The Results

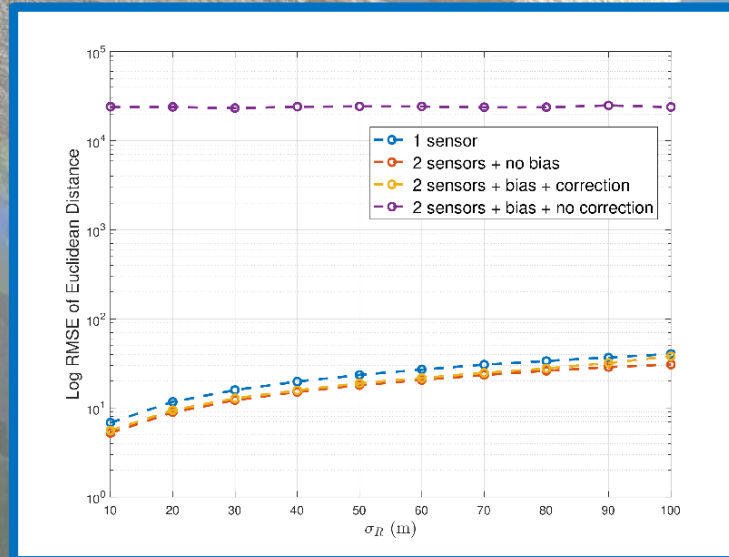<u>Tracking performance</u> (RMSE of <u>Euclidean distance</u>) of <u>four sensor configurations</u> compared.

Before fusion and correction…
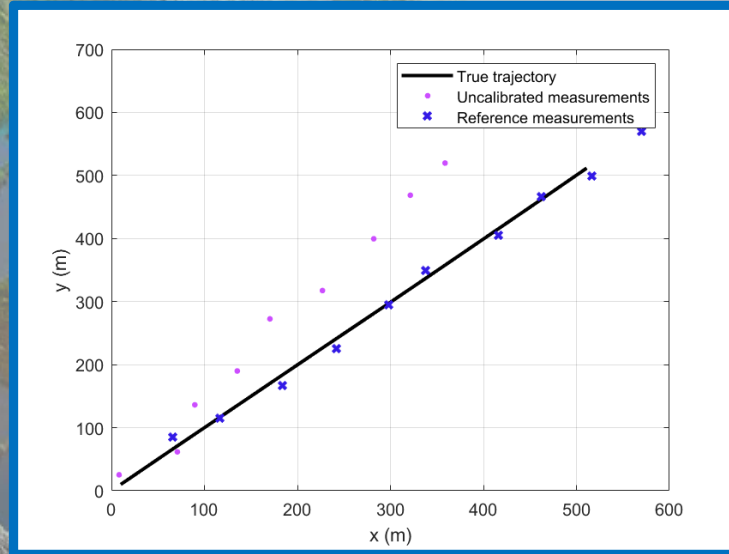
After fusion and correction…

Tracking performance vs σ_R

Reference sensor, s_1

Uncalibrated sensor, s_2

Object of interest
$[x \;\; \dot{x} \;\; y \;\; \dot{y}]^T$

0m   28,000m