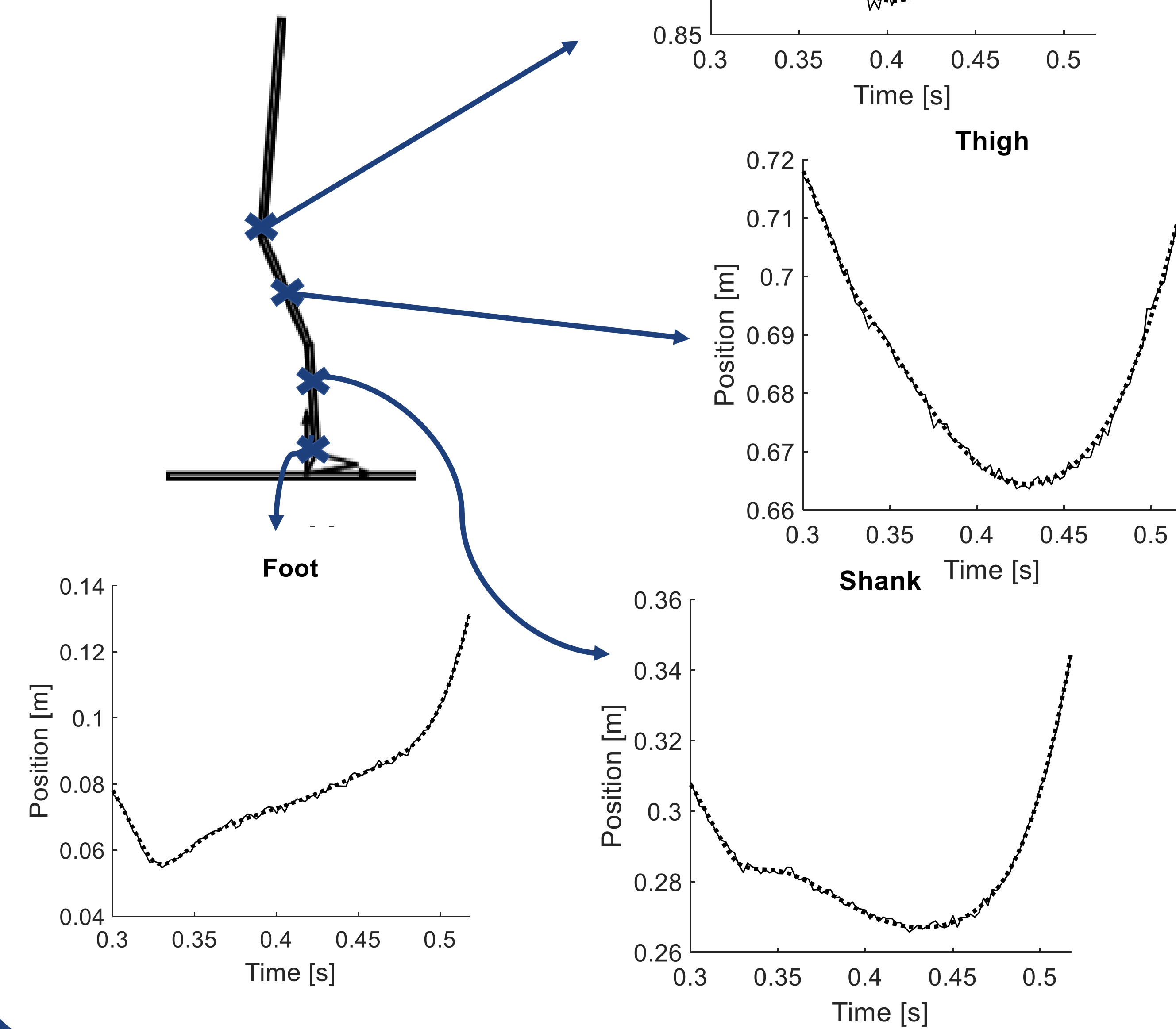


Introduction

- Filtering noisy biomechanical kinematic signals may require a more flexible approach than is currently used.
- Recently proposed approach better approximates acceleration from single noisy signal [1].
- New procedure applied in estimation of vertical ground reaction forces (vGRF).

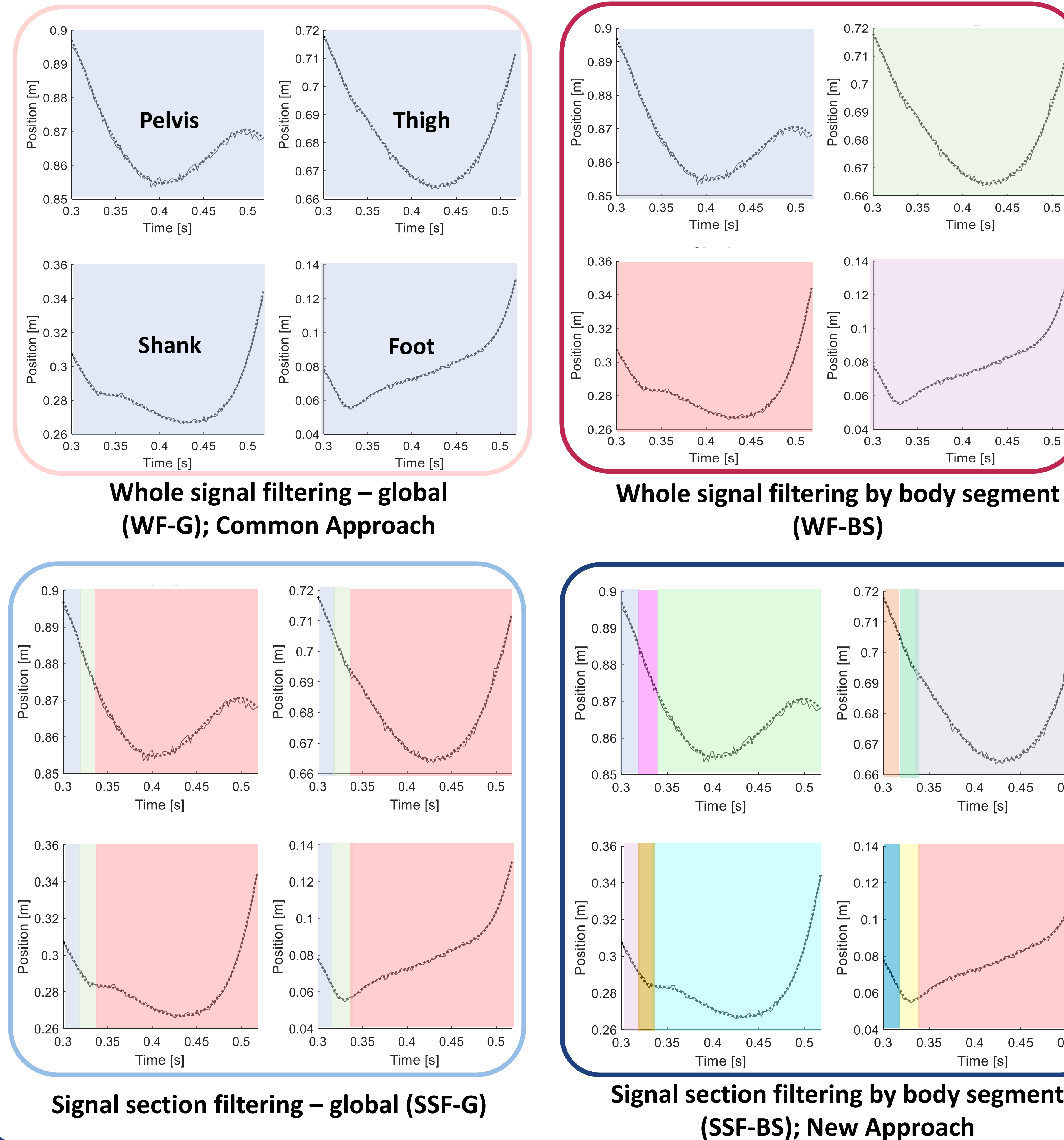
Data

- Noiseless kinematics and vertical ground reactions forces from four-link simulation of human running [2].
- White noise added to center of mass position signals (five different noise levels).

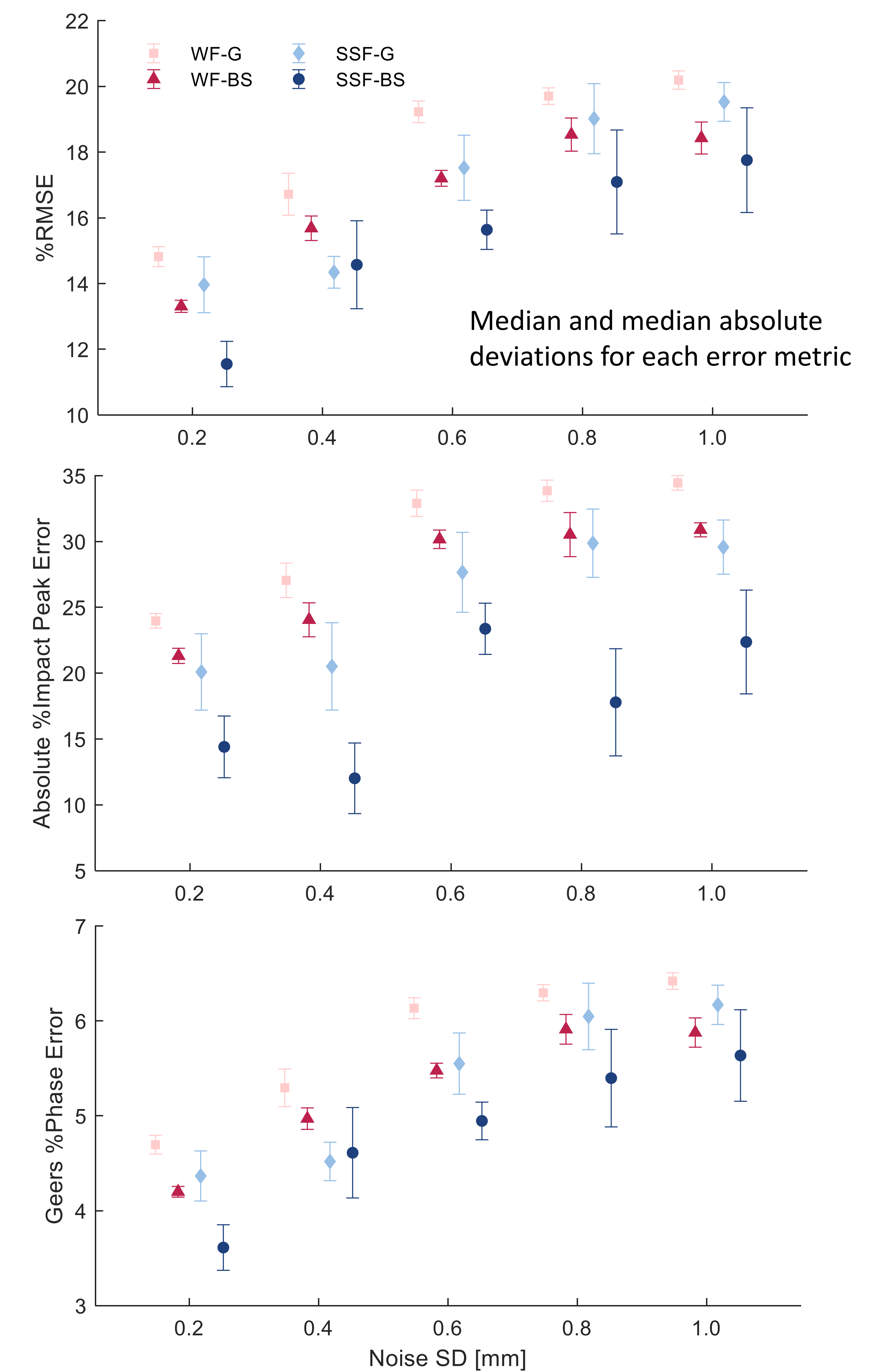


Filtering Approaches

- Filter cut-off frequencies determined using Autocorrelation Based Procedure [3].
- Signals sectioned using Teager-Kaiser energy [4] of vertical ground reaction force estimated from WF-G approach.
- Different colors represents a different filter cut-off frequency used on that portion of noisy signal.



vGRF Estimation Results



Conclusion: Using cut-off frequencies determined based on local signal characteristics improves estimation of vertical ground reaction force compared to common biomechanical signal processing techniques.