How Connecting the Legs with a Spring Improves Human Running Economy

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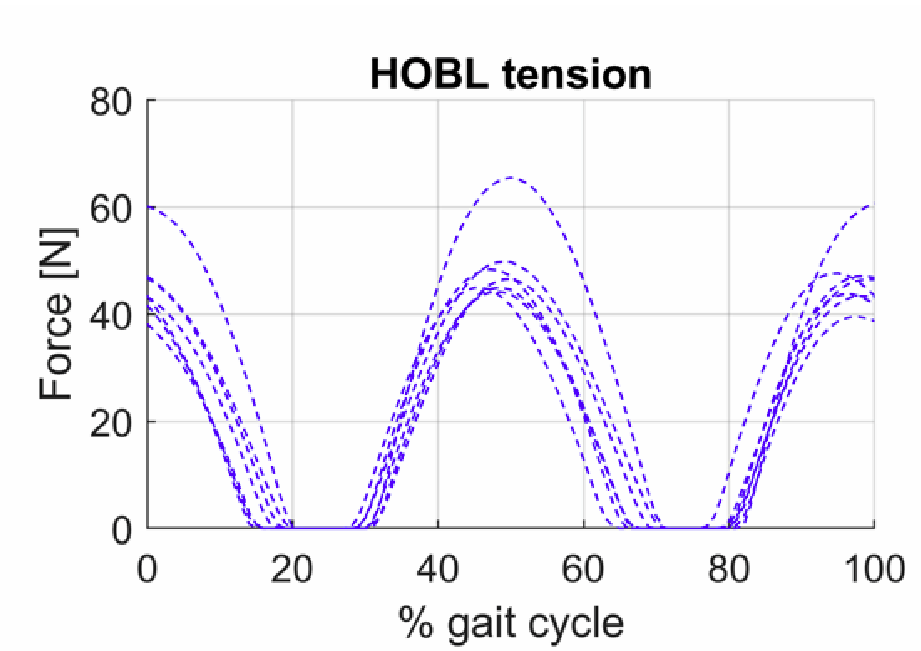
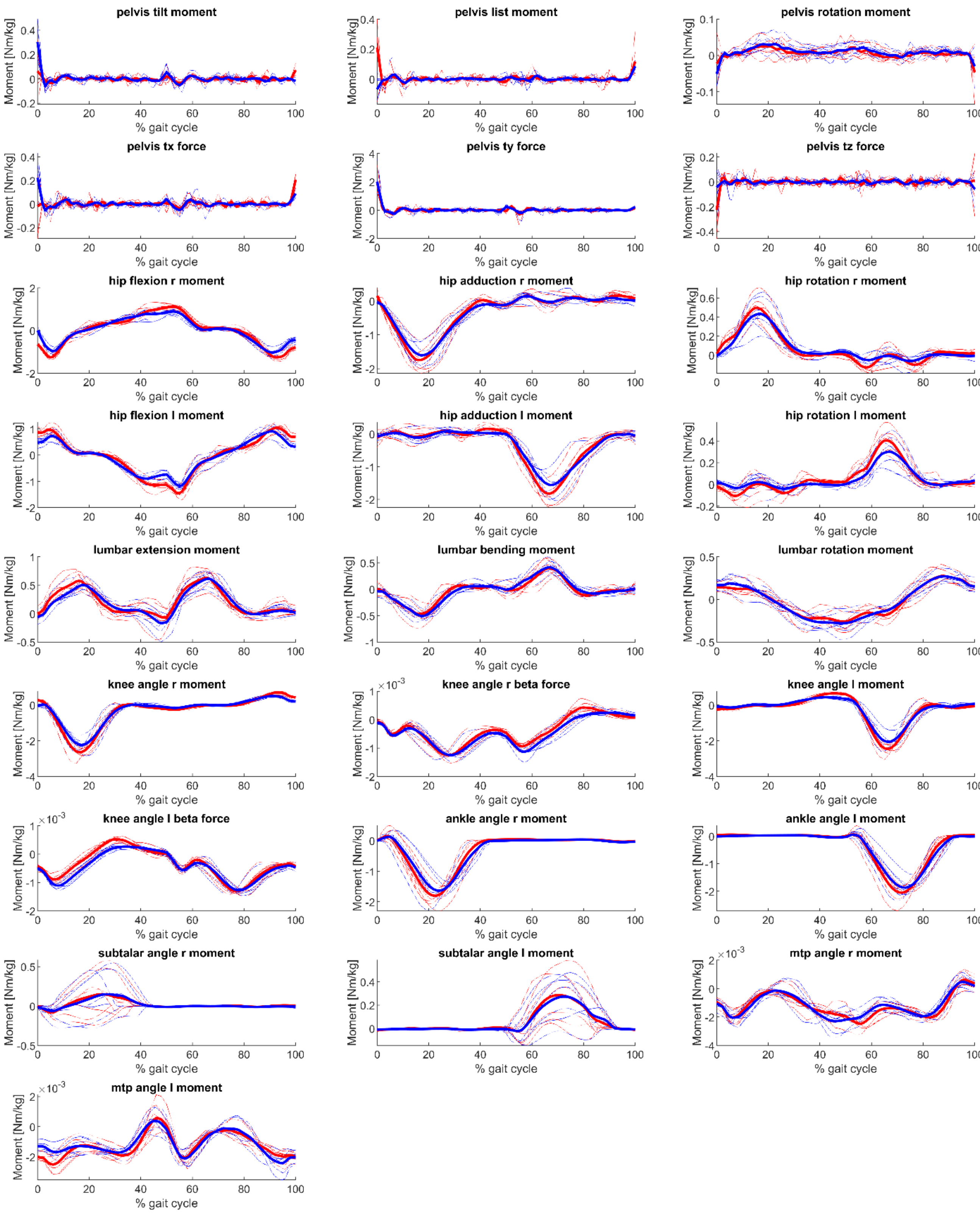
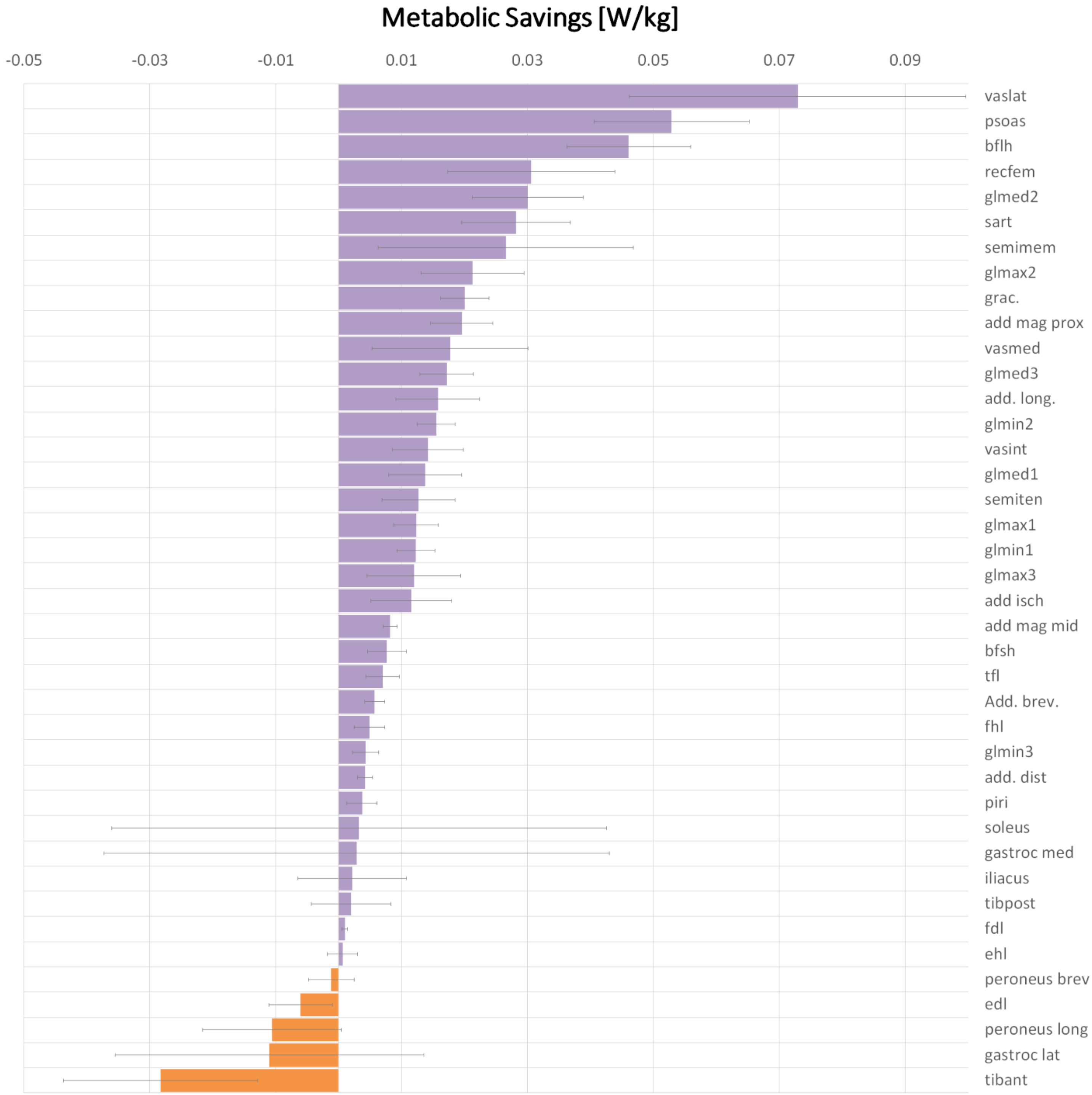
The following figures were gathered from the data used in the paper analysis, and might provide curious readers with some additional details into how runners adapt when using an exotendon. All data is contained in the project SimTK repository, and analysis code is available on the project Github that is also listed in the project description.



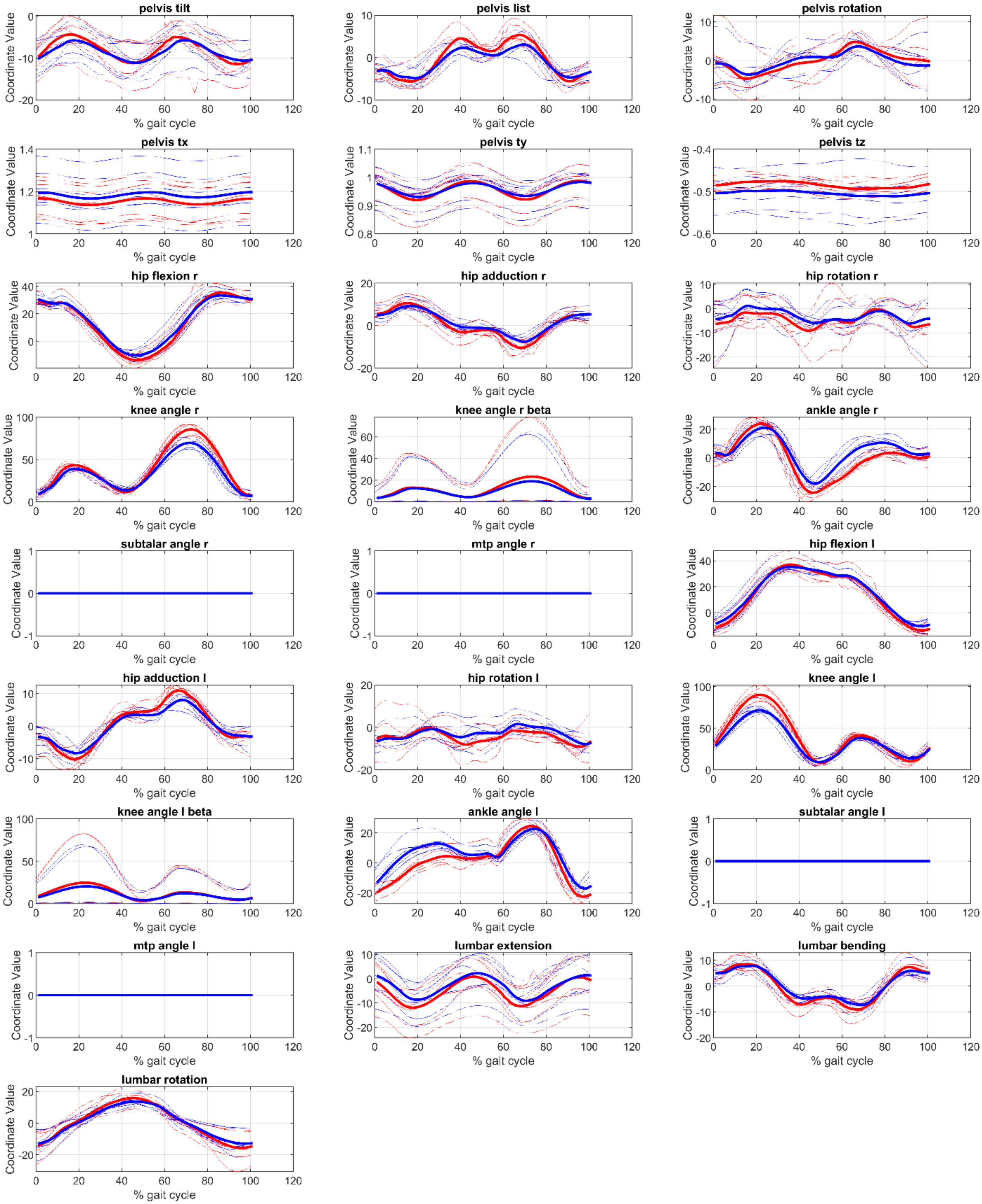
S1: The tension forces experienced by the simulated exotendon path spring are plotted throughout the gait cycle (starting with heel strike) for each subject.



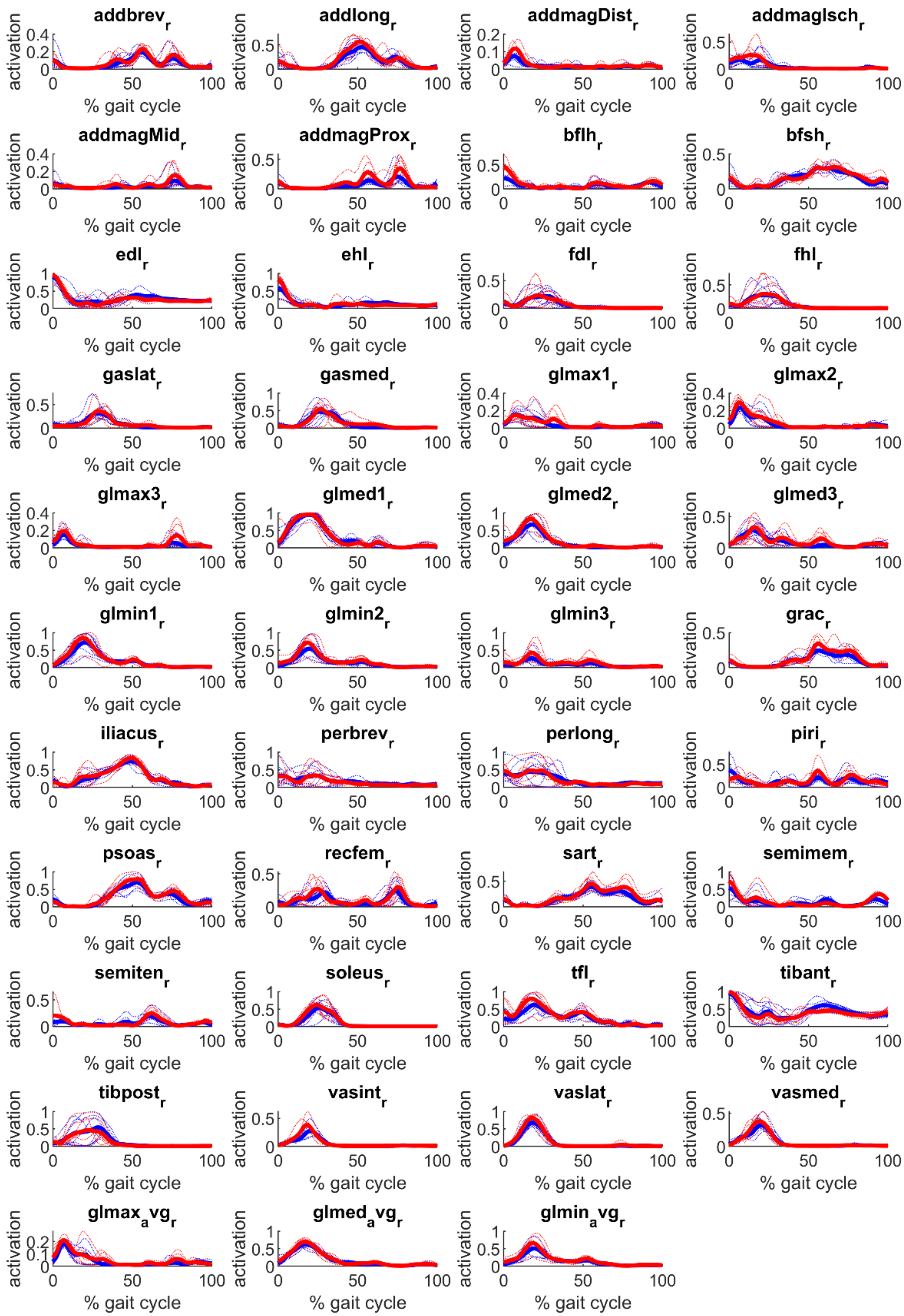
S2: Individual (dotted) and average (solid) joint moments plotted for the natural (red) and exotendon (blue) running conditions through the gait cycle starting with heel strike. Note that translational coordinates are in units of Newtons.



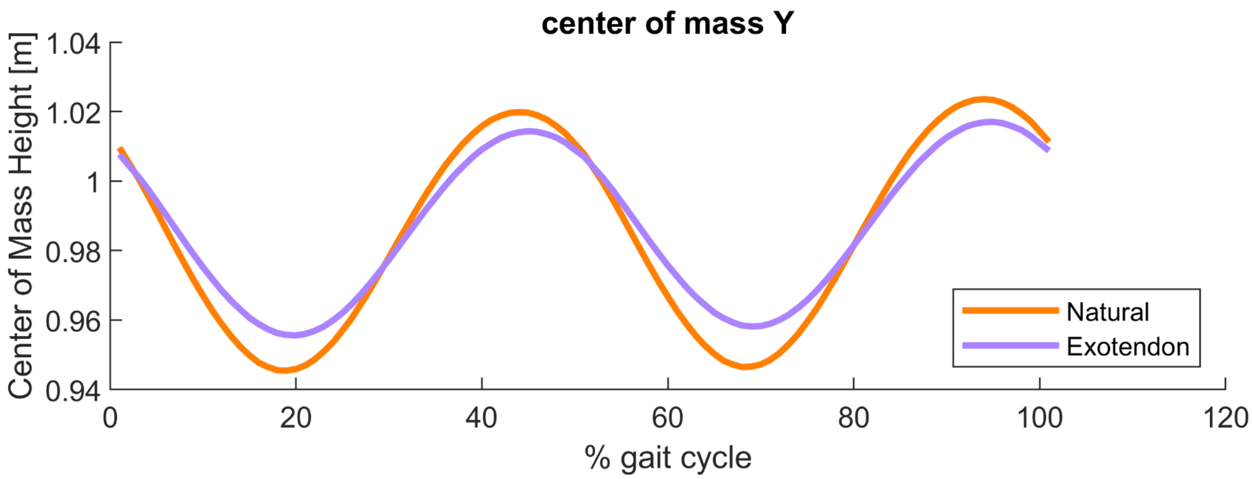
S3: Individual muscle changes in the average rate of energy expenditure from natural to exotendon running are shown.



S4: Joint angles plotted throughout the gait cycle (starting with heel strike) for the degrees of freedom in the model. Translational coordinates are in units of meters, and rotational coordinates are in degrees. Note that the mtp and subtalar ankles were locked in inverse kinematics.



S5: Muscle activations averaged across all subjects for the natural (red) and exotendon (blue) conditions.



S6: The average model vertical center of mass is plotted throughout the gait cycle for the natural (orange) and exotendon (purple) running conditions.