Response to Reviewer 2 Comments

Point 1: Since the paper is adressed to the Sensors journal and not to a biomecanics journal I propose that some additional figures would be necessary regarding how to use the equipment presented in Fig. 2. Thus, in the Paragraph 2.1 specifications are made regarding the X, Y and Z coordinates as well as the three displacements (0,0,0),and three angles (0,0,0) but these are not indicated in Fig. 2 or in an aditional figures.
[…]
I hope that some supplementary details focused on the simulator presented in Fig. 2 will improve the paper.

Response 1: Thank you very much for this feedback. The following changes/additions have been made to address this issue:
In the first paragraph of section 2:

> *"To investigate the accuracy of IMU-based systems to estimate flexion/extension, ab/adduction, and int/external tibial rotations, we established a simulator setup that was able to recreate tibiofemoral kinematics throughout in vivo measured functional activities of daily living. To achieve this, we applied the open-source kinematic data collected experimentally by Schütz et al. in 2019 [23]. In their study, a moving fluoroscope was employed to capture the tibiofemoral implant kinematics of six total knee arthroplasty (TKA) patients* ***(average age of 72.8 ± 8.5 years; BMI 24.3 ± 2.2 kg/m²)****, each with a unilateral PFC Sigma cruciate retaining fixed-bearing prosthesis (Depuy Synthes, Warsaw, IN, USA), during level walking, stair descent, and sit-to-stand-to-sit.* ***At the time of assessment, all subjects showed good functional outcome (Knee Injury and Osteoarthritis Outcome Score 91.2 ± 5.7, no/very low pain) and were measured in the gait lab at least 1 year post-operatively (4.2 ± 3.5 years).*** *This subject-specific data was used as input to guide the kinematics of two independent arms of the joint simulator (described below). Output measurements of the physical rotations actually performed by the simulator then served as ground truth data in order to investigate the accuracy of IMU-based angle derivation.";*

In the second paragraph of subsection 2.1:

> *"To set the reference pose, the upper segment was positioned to correspond with a flexion/extension gimbal arm* ***parallel*** *to the base plate (Figure 2), and ab/adduction actuators at the centre of travel. Meanwhile, the lower segment was centred along both the anteroposterior (AP; Cartesian Y-axis) and mediolateral (Cartesian X-axis) axes, as well as about the int/external rotation actuator axis. Finally, axial translation was set to correspond with an offset of 0 mm from the default (factory-defined) Z position.* ***These axes corresponded to the original subject data captured in the gait laboratory [23].*** *This specific configuration was set to correspond to the Grood and Suntay translation (0, 0, 0) and angular coordinates (0, 0, 0).";*

In the last paragraph of subsection 2.1:

> *"Subject-specific kinematic data were made compatible with the simulator coordinate system by expressing rotations of the tibia relative to the femur, as per Grood and Suntay [24]. Standing up and sitting down motions were combined into a single movement by concatenating the respective average signals of each subject in order to ensure a cyclical signal such that the simulator could execute the motion smoothly over multiple iterations. For certain trials in which the subject did not return to their original posture, the kinematic data was smoothed (using De Boor's approach [25] to fit a cubic smoothing spline with a smooth factor of at least 0.5) to remove any jumps in the signal. Here, smoothing was deemed necessary when the simulator failed to complete haptic mapping (an automated process run as part of the iterative learning control feature [26]). Once the necessary smoothing had been applied, kinematic data corresponding to the subject rotations and anteroposterior translations (mean movement pattern of all activity trials) were input (totalling three activities for each of the six subjects).* ***Imported as text files, data were transferred onto the simulator's host PC using a USB flash drive.*** *Here, AP translation and int/external rotation were applied to the tibia, while flexion/extension and ab/adduction were applied to the femur. One cycle iteration was performed per second and sampled at 100 Hz.";*

In the caption of Figure 2:

> *"Two inertial sensors were attached to the joint simulator* ***(shown here in reference pose)*** *using mounting adhesive tape: one was attached to the condylar adapter component (top), and the other to the tibial adapter component (bottom). Custom rapid prototype adapters (in blue) were developed to ensure both sensors could be easily adhered onto a flat surface.";*

And finally, in the annotations added to Figure 2:

