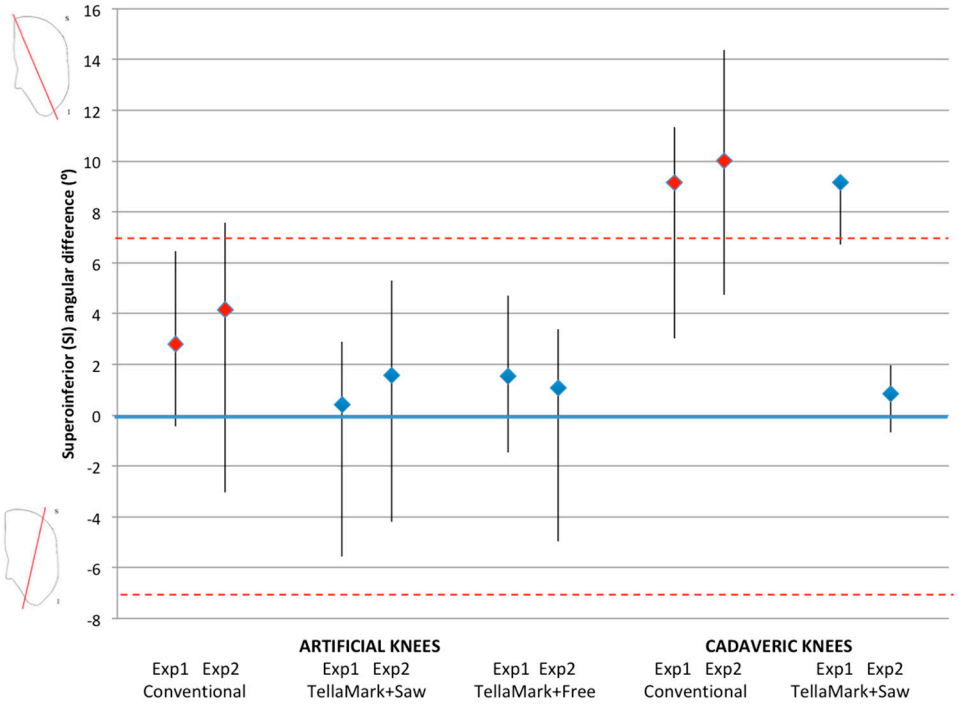

Figure 8. Superoinferior (SI) angle difference from the desired plane, showing the median, minimum and maximum, for the artificial bone models and cadaveric specimens, using the conventional saw guide (red markers), TellaMark + saw guide and TellaMark + freehand (blue markers). The dashed red lines indicate the symmetry goal (±7°). The substantially more accurate TellaMark vs. conventional results for Experimenter 2 vs. Experimenter 1 may be due to leaving the guideline visible (which is now recommended) and carefully centering the device on the patellar surface (a centering device will be added in the future).

3.3. Bone Remnant Thickness

In the artificial bone testing, there were no significant differences in thickness between the three techniques (averaging 0.6 mm, 0.5 mm, and 0.7 mm thinner than intended, for the conventional technique, TellaMark + saw guide and TellaMark + freehand, respectively, with standard deviations of 0.6 mm, 1.0 mm, and 1.0 mm, respectively). In the cadaveric testing, the bone remnant tended to be thinner than intended with the conventional technique (-0.9 ± 0.5 mm) and thicker than intended with the TellaMark + saw guide (1.0 ± 1.0 mm), resulting in a significant difference between the two techniques ($p < 0.001$), although both averaged close to the intended thickness.

3.4. Procedure Time

In the artificial bone testing, there were no significant differences in time between techniques (3.8 ± 1.1 min for TellaMark + saw guide, 3.6 ± 0.7 min for TellaMark + freehand, 4.0 ± 0.7 min for the conventional technique), however the time breakdowns did differ, with more time required to perform recuts with the conventional saw guide whereas TellaMark required more initial time leading up to the resection. The main time consumption in both cases related to securing the patella with the saw guide or towel clips, and performing the cut. The time taken was significantly different between experimenters ($p = 0.002$), whereby Experimenter 2 took 50 s longer on average to complete a resection.

In the cadaveric testing, resection time was significantly shorter with TellaMark than the conventional technique (4.8 ± 1.8 min for TellaMark vs. 7.2 ± 1.2 min for the conventional technique; $p = 0.03$). As with the artificial bone testing, the TellaMark device took more time initially whereas the conventional device took more time later.