Motus Mechanical

Performance Datasheet

Double Compound Linear Translation Stage

The double compound linear translation stage features linear translation with an open framed moving platform (the 5 x 5 center block). The open frame design may be useful for moving specimen that require an unimpeded line of sight. A 3 x 3 block can be fastened inside this platform to provide more fixture locations if needed. This translation stage has been designed for exact constraint (i.e. is not over or under constrained). This enables the device to offer both high-repeatability and an 8 mm translation range. More range is possible if return springs are used to enable translation in the reverse direction. Thinner springs (0.3 mm springs used for this version) will also yield more translation range. This device can be assembled quickly, usually in under 30 minutes.

Figure 1: Double compound linear translation stage assembled using MechBlocks from Motus Mechanical.

Defining the x-axis as the primary direction of motion, as shown in Figure 1, the roll, pitch, yaw, straightness in y, and straightness in z were measured. The pitch and yaw were measured using an Optodyne LDDM laser interferometer. The roll was measured by spacing two DTM22 Lion precision capacitance gages 2 inches (50.8 mm) apart and measuring against two gage blocks attached to the side of the translation stage. By measuring the relative change in displacement between the capacitance gages, roll was calculated. Straightness in y and z was each calculated using only one cap gage measurement. All measurement gages were set up using

Figure 2: Image showing one of the metrology configurations with custom fixtures produced from MechBlocks. Note that these are our previous generation products which have now been updated.

custom fixtures produced from MechBlocks, see Figure 2. The results of the tests are shown in Figure 3 through Figure 7.

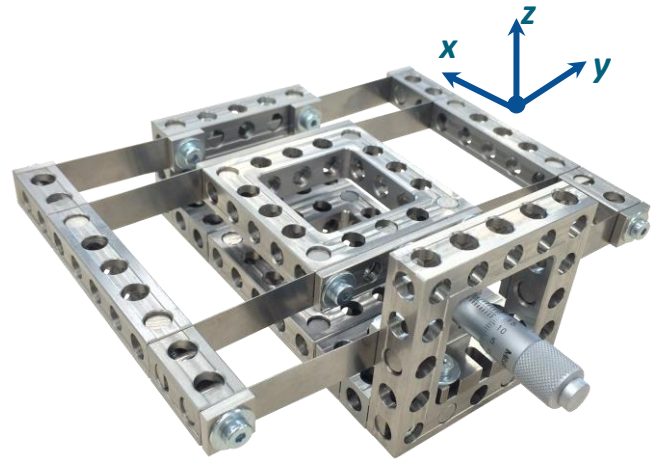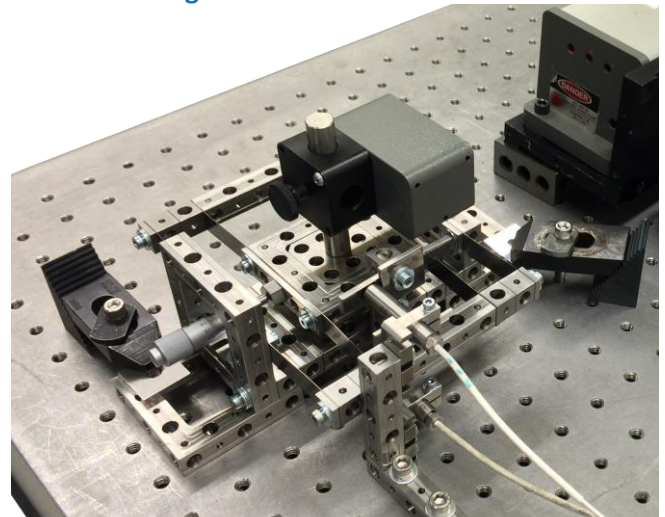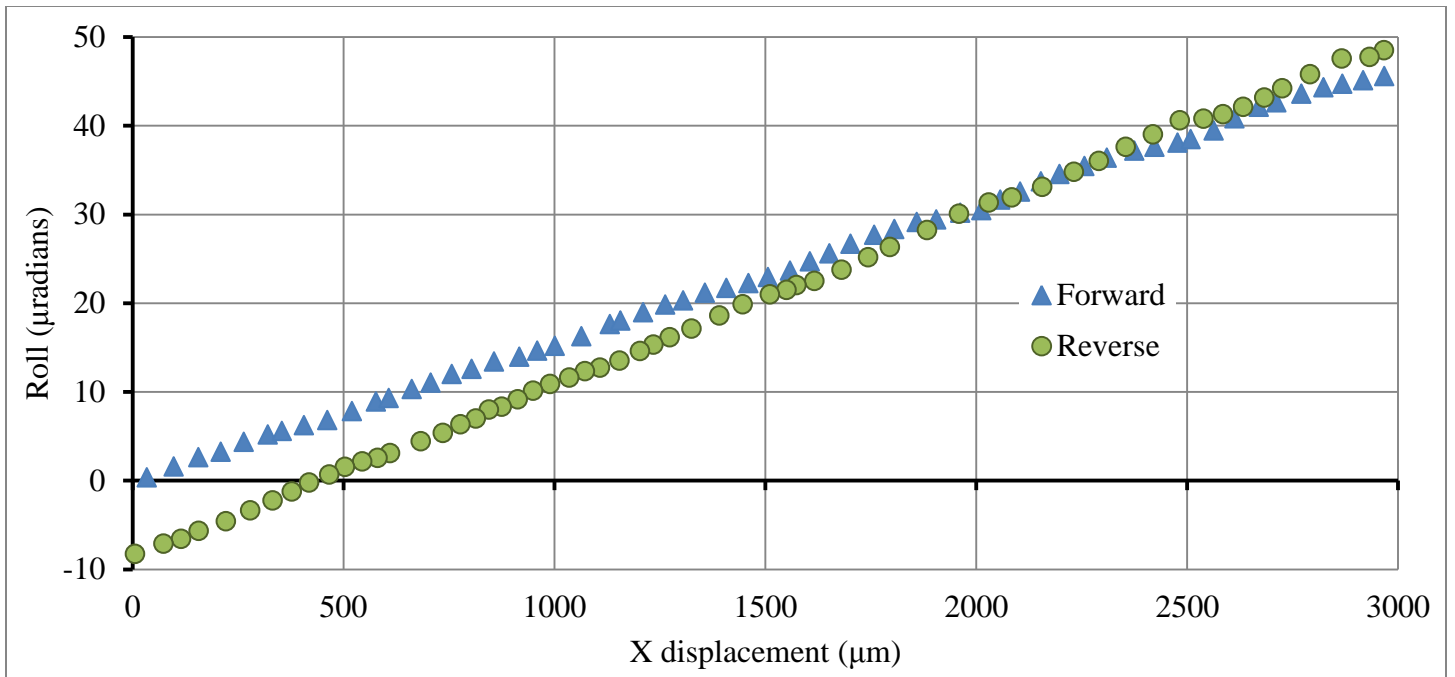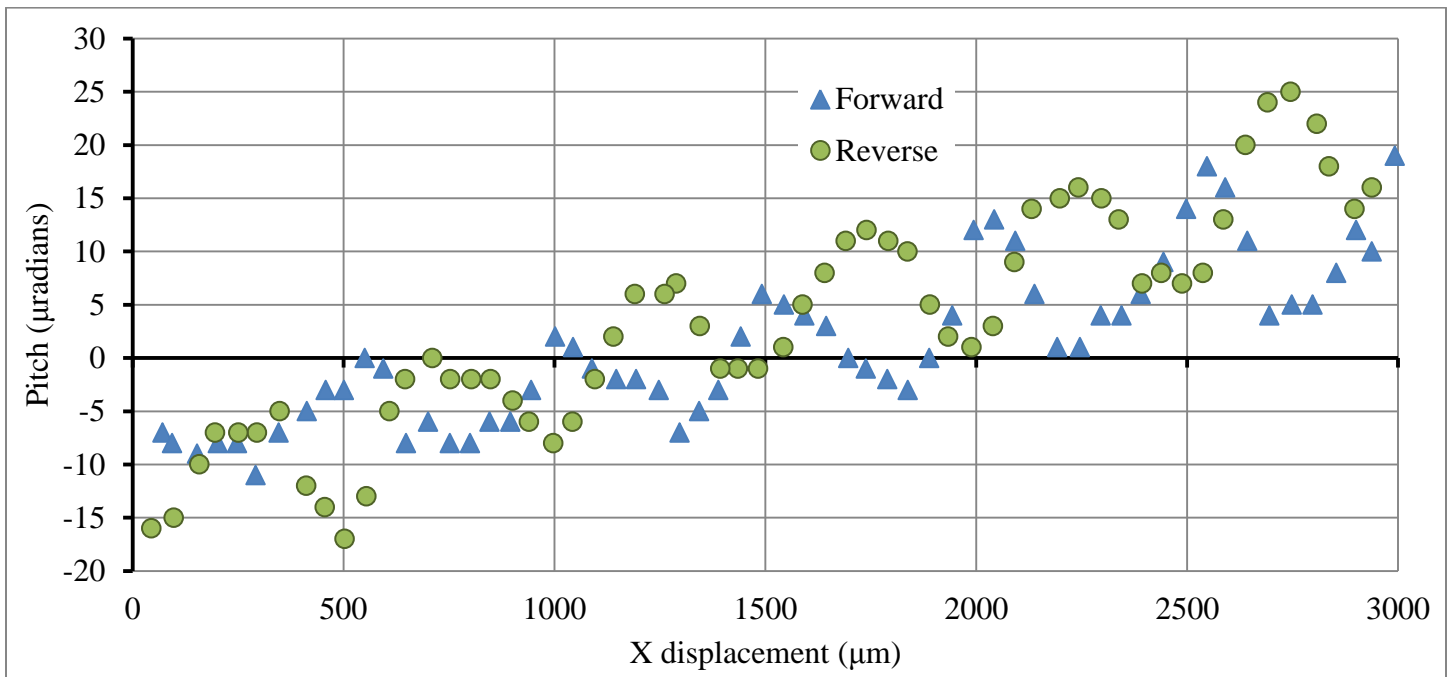**Figure 3: Plot of roll (rotation about the x-axis).**

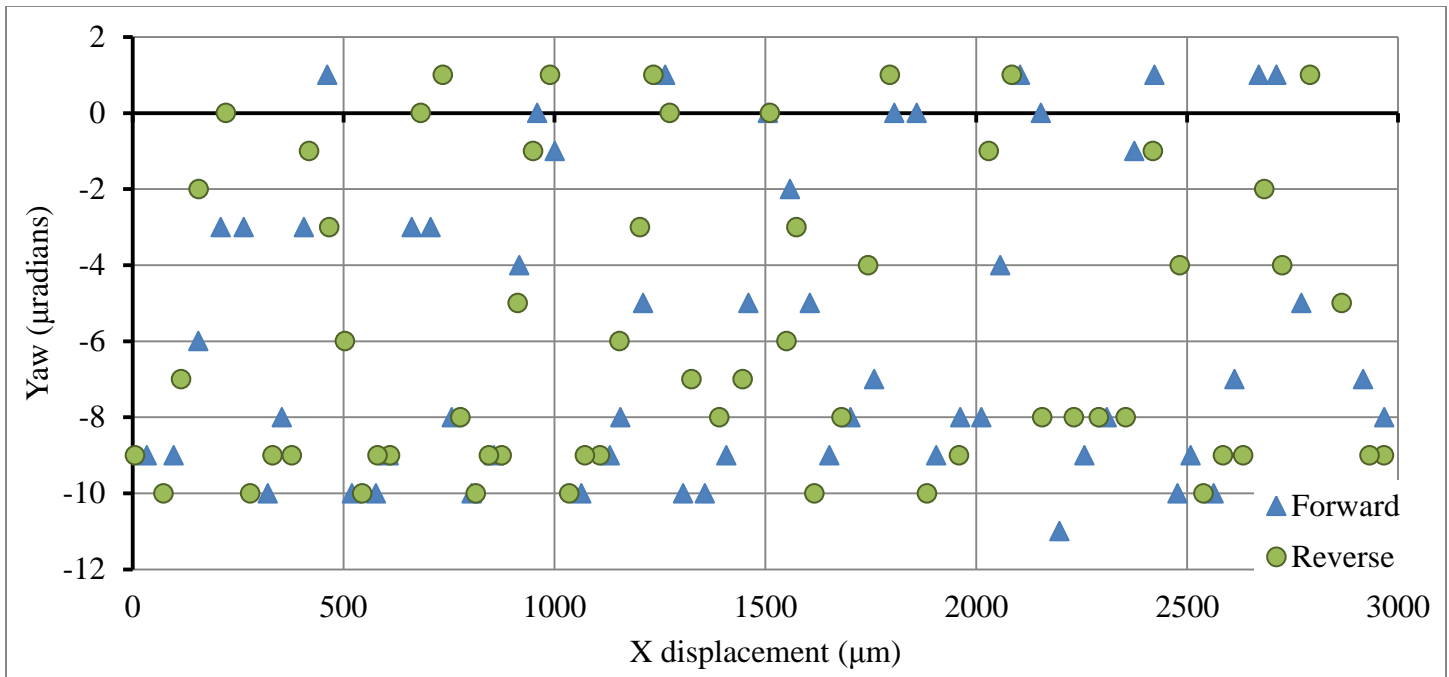**Figure 4: Plot of pitch (rotation about the y-axis).**

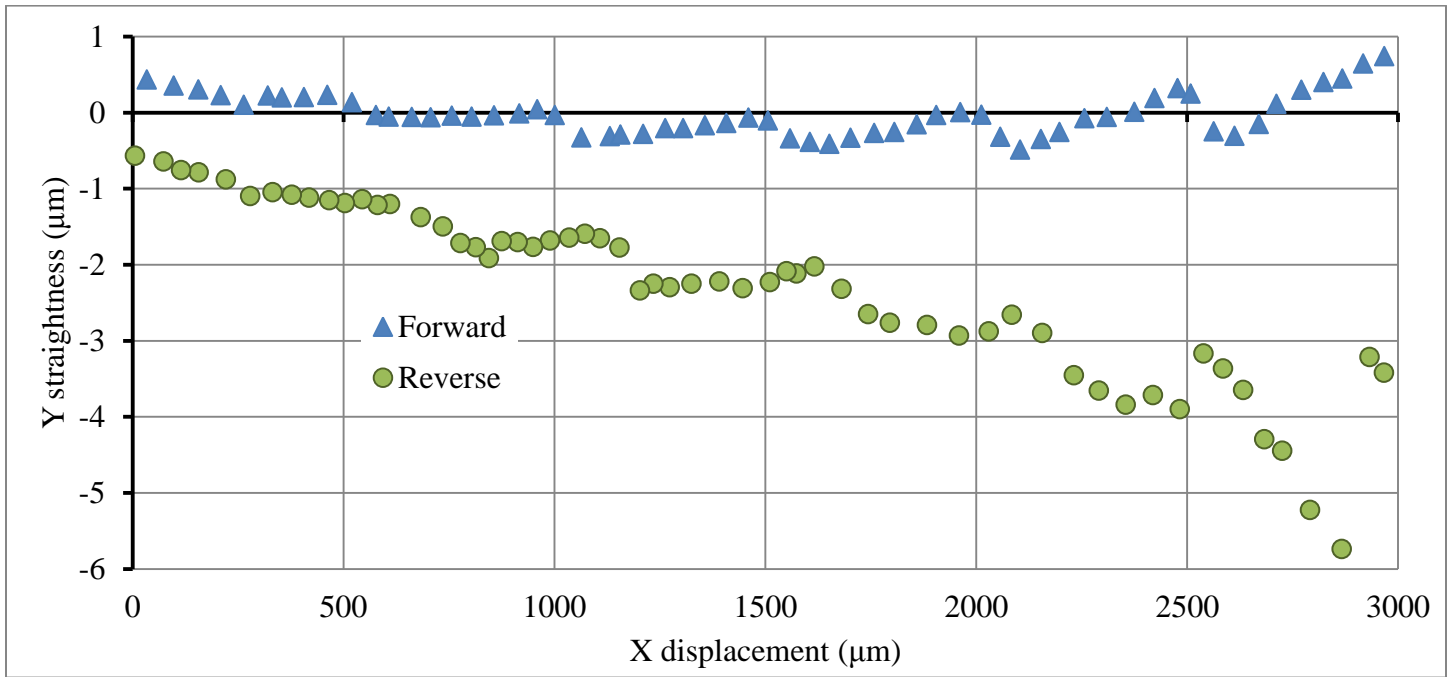**Figure 5: Plot of yaw (rotation about the z-axis).**
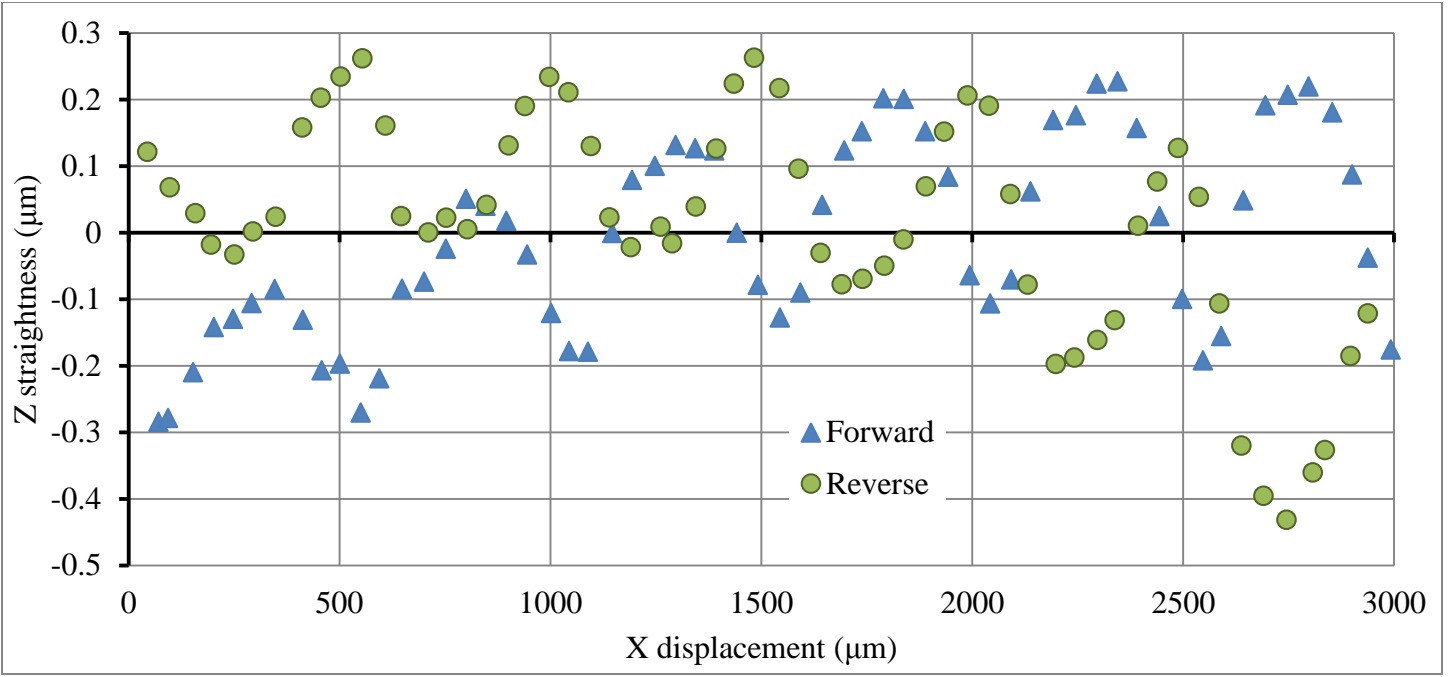

Figure 6: Plot of y-straightness (deviation in the y-axis).

Figure 7: Plot of z-straightness (deviation in the z-axis).