

# OUTPUT//CAPTURE CMJ VALIDATION

## INTRO

To investigate the concurrent validity of the Output V2 IMU for measuring Counter-Movement Jump (CMJ) height, the system was compared to an optical measurement system (OptoJump). It is essential that a system has good validity and accuracy for evidence-based practice which is vital for any practitioners using the Output Capture system. Given the portability and practicality of the system, this will ensure that wherever and whenever practitioners are, they will be able to accurately measure CMJ height.

## METHODOLOGY

An OptoJump was used as the ground truth for this validity investigation, as it has been shown to have excellent concurrent validity with force platform data. The Output V2 IMU was worn on the foot for the investigation while performing the various CMJs. A total of 26 participants participated in the study. They all completed CMJs of varying heights with their hands on their hips, with each participant completing 1-12 CMJs. A total of 163 CMJs were recorded for the investigation. The Pearson Correlation Coefficient ( $r$ ), Adjusted  $R^2$ , Mean Absolute Error (MAE), and Root Mean Square Error (RMSE) were used to complete the analysis.

## RESULTS

The results can be seen in Table 1 below. All measurements were plotted in a correlation plot and can be seen in Figure 1.

<b>r</b>	0.996
<b>Adj. R<sup>2</sup></b>	0.991
<b>MAE</b>	0.83 cm
<b>RMSE</b>	1.04 cm

## CONCLUSION

These results show a strong correlation and excellent agreement between Output V2 IMU and OptoJump. A limitation of this investigation is the number of participants that were included. Further investigation could be carried out to validate Output V2 IMU across a wider cohort of participants of varying ability. However, given the high correlation and excellent agreement, it is expected that this accuracy will carry over to practical application of CMJ testing. Therefore, enabling practitioners to accurately

measure CMJ height, without the usual laboratory constraints, using the Output V2 IMU.

## CORRELATION PLOT // JUMP HEIGHTS

**OUTPUT** vs. **OPTOJUMP**

JANUARY 2023

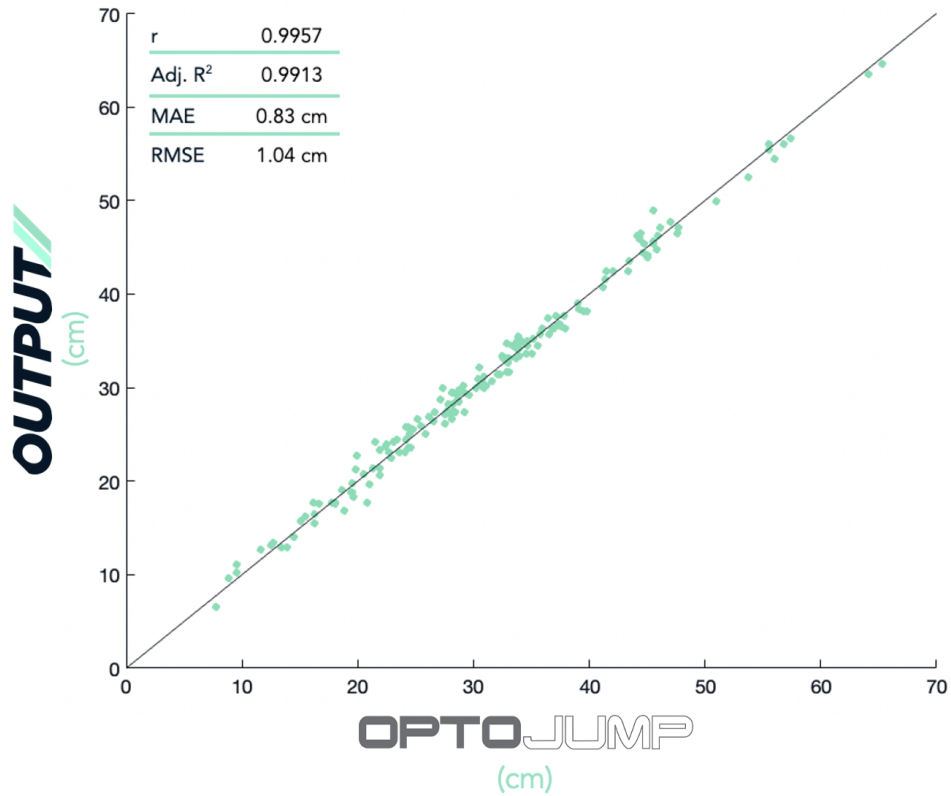


Figure 1 - Correlation Plot Jump Heights