The Time of Slip Onset During Stance Influences the Characteristics of the Unconstrained Perturbation

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Figure 1: Slips that occur at different points of stance may elicit unique conditions compared to those that happen at heel-strike.

Figure 2: An assembled WASP device mounted to a shod prosthetic foot. Upon receiving a trigger signal sent via Bluetooth connection, power is supplied to an internal electric motor that releases the outsole. This exposes the wearer to a low friction surface on top of the outsole, thereby causing a slip.

Figure 3: An illustration of the three slip variables described above.

Figure 4: Scatter plots relating slip onset with the three observed slip variables.

ONSET TIME IMPACTS SLIP MECHANICS

A. Slip Direction vs. Onset

B. Slip Distance vs. Onset

C. Slip Velocity vs. Onset

CONCLUSIONS

• The timing of a slip during stance significantly influences the experienced slip mechanics that must be countered to maintain balance
• Implementing a broad range of slip onset times may enhance fall prevention programs by preparing individuals for a comprehensive range of attributes

REFERENCES