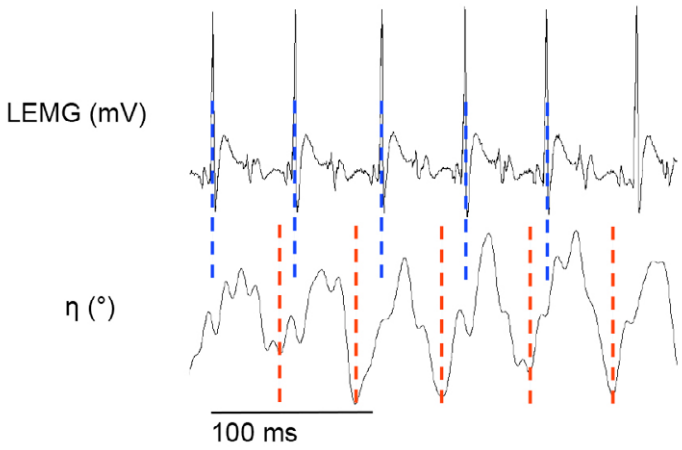

Fig. S1. Kinematic latency following electromyography (EMG) activity (see Materials and methods). The roll (η) angle showed the most obvious change relative to other rotational angles. The blue vertical lines show the timing of a spike in the left (L)EMG, while the red vertical lines show the negative η angle peak. Data are from the same animal represented in Fig. 2.

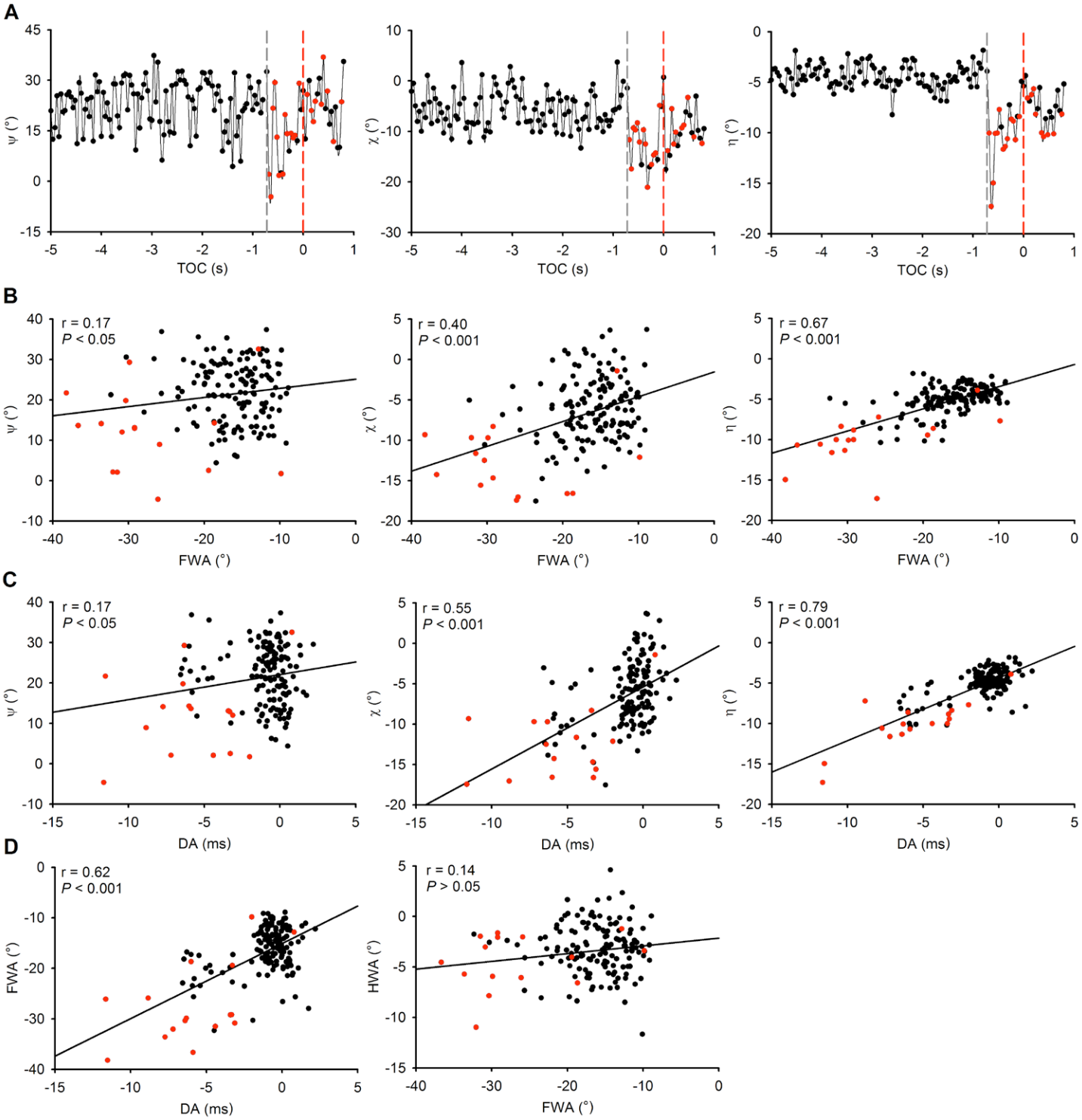

Fig. S2. For all three top panels, the vertical grey dashed line represents time of a turn (TOT), the vertical red dashed line represents TOC, and red symbols indicate events associated with double LEMG spikes. For all other panels, *r* is the Pearson product moment correlation coefficient describing the linear regressions (black lines). ψ and χ angles were the most variable during the pre-turn epoch but shifted negatively at TOT. η angle also displayed a clear decrease around TOT. Double spiking was observed from the LEMG during the turn and continued past TOC. η angle was most strongly correlated with changes in FWA. DA was a good predictor of changes in η and FWA. There was no relationship between FWA and HWA.

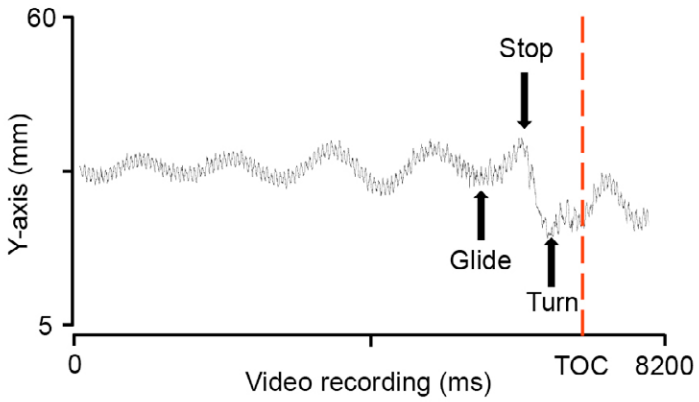

Fig. S3. Displacement in the *y*-axis of the top tether mark of a single animal during an entire video recording that included a glide, stop and turn in response to a looming stimuli. During straight flight, the locust's *y*-axis increased and decreased rhythmically during corrective steering to maintain altitude in the centre of the airflow. When the animal performed a glide, the *y*-axis displacement stabilized followed by an increase as flapping flight resumed and a dramatic decrease after the animal stopped beating its wings. The *y*-axis position increased when the animal performed a left turn just prior to TOC (red vertical line). These data demonstrate that locusts were capable of stable flight and that the length of the tether did not constrain orientation in the *y*-axis. The time axis represents the entire video recording and the *y*-axis was scaled to illustrate the difference in *y*-axis displacement.

Movie 1. Video recording of a locust during an evasive turn to the left in response to a looming stimulus. For consistency, we used the same animal as represented in Fig. 2. Two high-speed cameras were used to capture and quantify the turning behaviour (left frame is from the left camera and right frame is from the right camera). The animation in the centre is a visual aid to represent the time-aligned expansion of the 7 cm looming disc (see Materials and methods) and was not the actual stimulus used. Frames are played back at 1/10 normal speed. For reference, total video playback is 82 s, the turn was initiated at $t \approx 63$ s and time of collision (TOC; when the stimulus example turns red) occurs at $t \approx 72$ s. Note the ↓WBF (wingbeat frequency) prior to any behavioural change, followed by a change in forewing asymmetry (FWA) in the frame at which the turn is initiated and ↑WBF during the turn. Turning occurs in a single wing beat, and the abdomen moves up and to the left after the turn has been initiated.