



**Movie 1. Cliff swallow aerial contact.** This high-speed movie documents aggressive aerial contact among cliff swallows, behavior occasionally observed during chase sequences.

Table S1. Mixed-effects model results

AIC	Intercept (a)	Coefficient 1 (b)	Coefficient 2 (c)
$F' = a + b \theta'$			
84.08	-0.08	1.77***	-
$F' = a + b \sin(\theta')$			
91.94	-0.02	2.16***	-
$F' = a + b \tan(\theta')$			
159.23	-0.15	0.30*	-
$F' = a + b u$			
139.09	-0.02	0.19***	-
$F' = a + b \theta' + c u$			
85.07	-0.09	1.91***	-0.02
$F' = a + b \sin(\theta') + c u$			
90.42	-0.03	2.59***	-0.05
$F' = a + b \tan(\theta') + c u$			
141.04	-0.02	0.02	0.18***
$F' = a + b u^2$			
146.77	-0.12	0.02***	-
$F' = a + b \theta' + c u^2$			
85.74	-0.08	1.83***	-0.001
$F' = a + b \sin(\theta') + c u^2$			
92.5	-0.01	2.36***	-0.003
$F' = a + b \tan(\theta') + c u^2$			

147.33 -0.12 0.11 0.02\*\*

$F' = a + b \theta'$ , random effect: date

84.08 -0.08 1.77\*\*\* -

$F' = a + b \sin(\theta')$ , random effect: date

91.92 -0.02 2.16\*\*\* -

$F' = a + b \tan(\theta')$ , random effect: date

159.23 -0.15 0.30\* -

$F' = a + b \theta'$ , random effect: trial

82.04 -0.08 1.80\*\*\* -

$F' = a + b \sin(\theta')$ , random effect: trial

91.69 -0.02 2.19\*\*\* -

$F' = a + b \tan(\theta')$ , random effect: trial

159.23 -0.15 0.30\* -

$F' = a + b \theta'$ , random effects: trial nested in date

84.04 -0.08 1.80\*\*\* -

$F' = a + b \sin(\theta')$ , random effects: trial nested in date

93.69 -0.02 2.19\*\*\* -

$F' = a + b \tan(\theta')$ , random effects: trial nested in date

161.23 -0.15 0.30\* -

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\* p < 0.05 \*\* p < 0.001 \*\*\* p < 0.0001