

Table S1. Kinematic parameters of the dragonfly specimens.

Specimen	Flapping frequency [Hz]	Phase difference [deg]	Stroke-plane angle relative to the body [deg]	Forewing Φ amplitude [deg]	Hindwing Φ amplitude [deg]	Baseline of the positional angle of forewing [deg]	Baseline of the positional angle of hindwing [deg]	Average flight speed [m/s]
Dragonfly 1	23.8	87	63	70	69	2	-8.5 (10.5 ventral)	Tethered
Dragonfly 2	24.9	62	60	63	69	5.5	-0.5 (6 ventral)	Tethered
Dragonfly 2	25.4	-	60	-	65	-	-1.5	Tethered (with one forewing removed)
Dragonfly 3	26.7	83	65	62	64	5.5	0.5 (5 ventral)	Tethered
Dragonfly 3	24.6	-	65	-	59	-	2.5	Tethered (with one forewing removed)
Dragonfly 4	24.6	70	64	62	66	12	6 (6 ventral)	Tethered
Dragonfly 4	26.8	-	64	-	66	-	6	Tethered (with one forewing removed)
Dragonfly 5	22.6	85	67	67	61	14.5	8 (6.5 ventral)	Tethered
Dragonfly 5	21	-	67	-	58	-	6	Tethered (with one forewing removed)
Dragonfly 6	24	109	65	68	68	9	2 (7 ventral)	Tethered
Dragonfly 6	25	-	66	-	71	-	2.5	Tethered (with one forewing removed)
Dragonfly 7	24.5	77	65	62	61	-1	-7.5 (6.5 ventral)	Tethered
Dragonfly 7	26.1	-	63	-	60	-	-8	Tethered (with one forewing removed)
Dragonfly 8	31	105	70	Indeterminate	Indeterminate	Indeterminate	Indeterminate	1.6
Dragonfly 9	31.4	95	60	Indeterminate	Indeterminate	Indeterminate	Indeterminate	1.6
Dragonfly 10	37	92	66	Indeterminate	Indeterminate	Indeterminate	Indeterminate	1.2
Dragonfly 11	47	75	61	Indeterminate	Indeterminate	Indeterminate	Indeterminate	1.2
Dragonfly 12	37	90	68	Indeterminate	Indeterminate	Indeterminate	Indeterminate	1.7
Dragonfly 13	35	85	62	Indeterminate	Indeterminate	Indeterminate	Indeterminate	3
Dragonfly 14	35.5	100	60	Indeterminate	Indeterminate	Indeterminate	Indeterminate	1.5

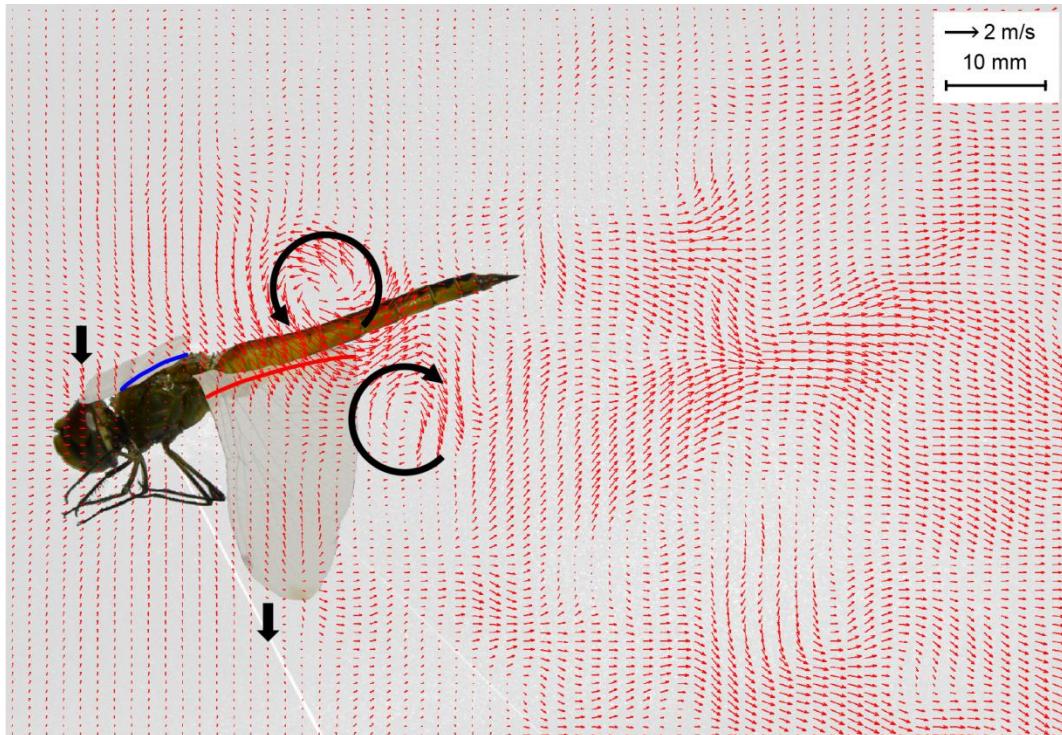
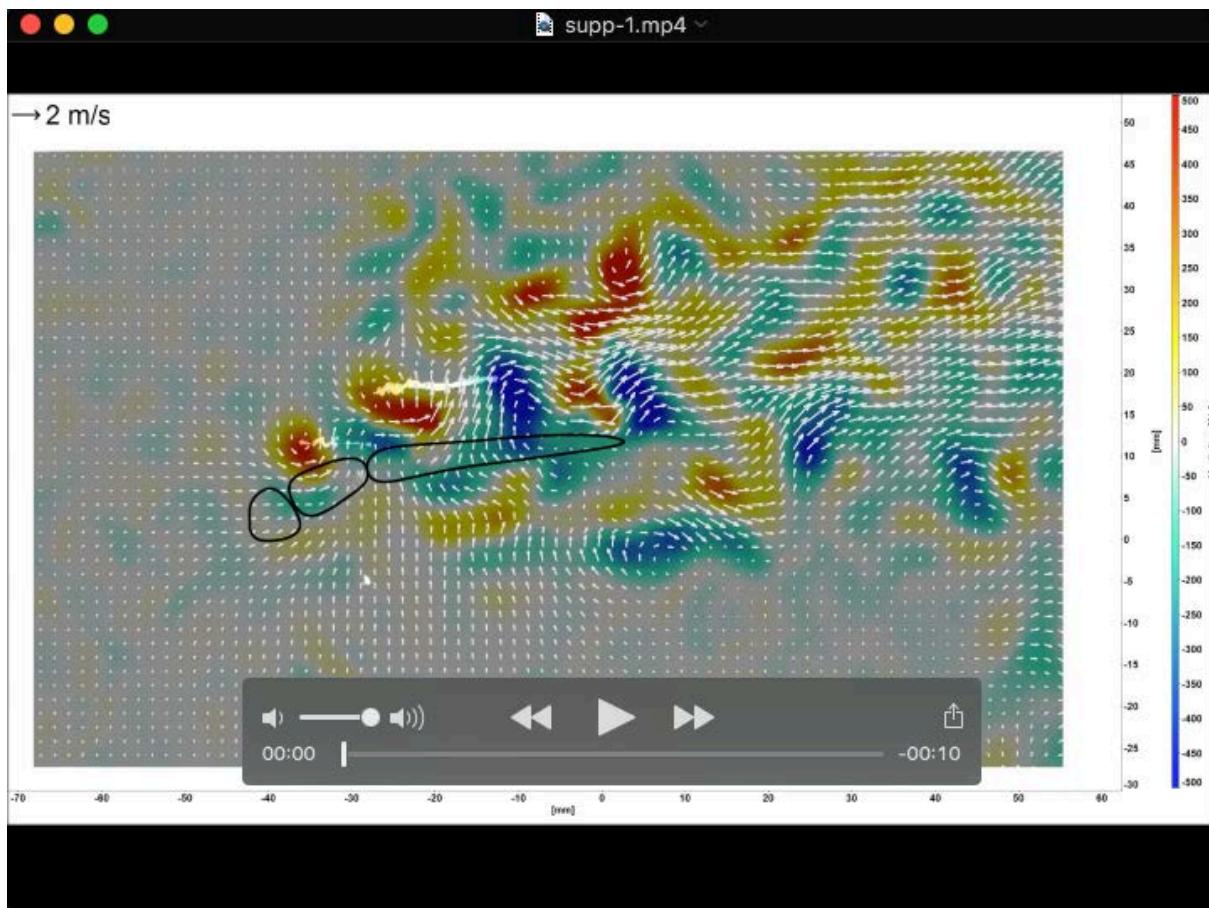
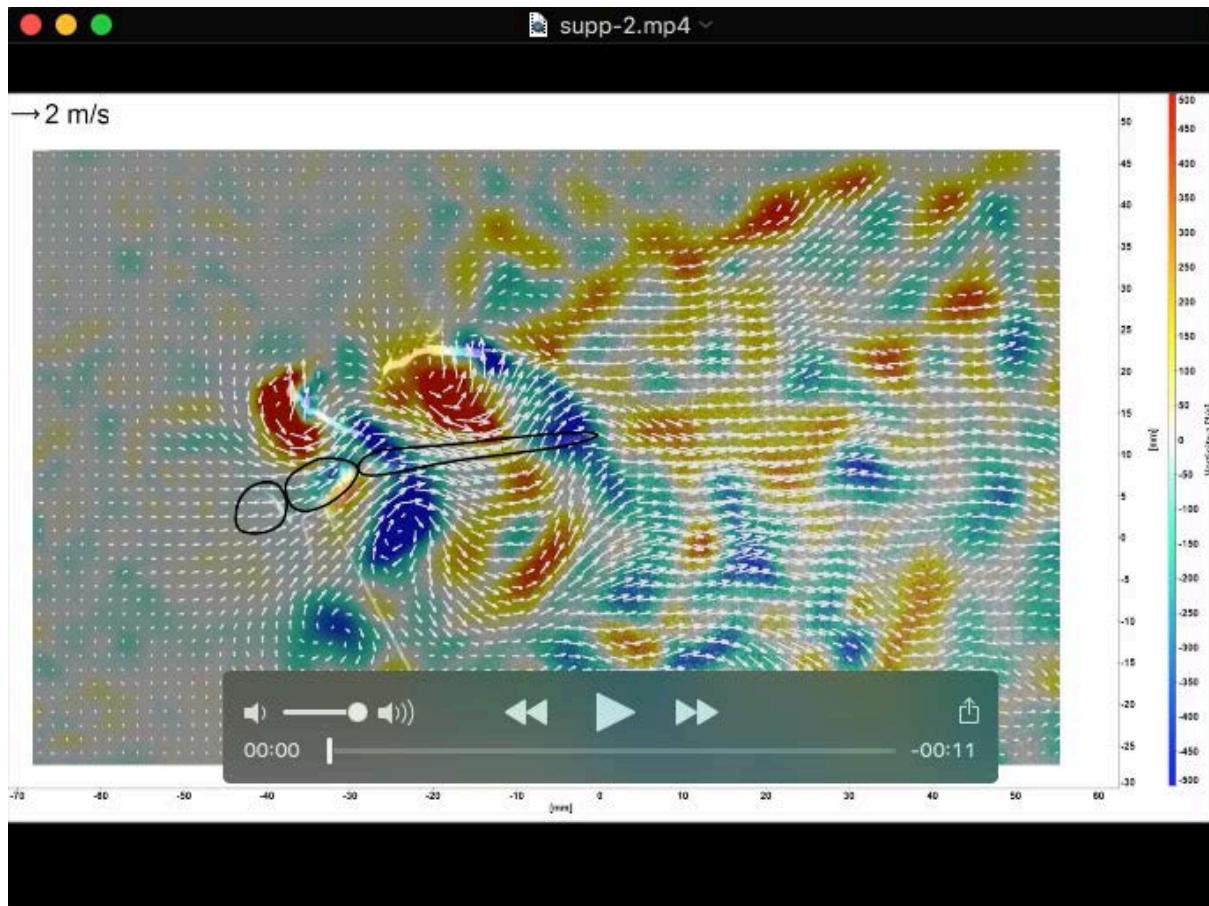


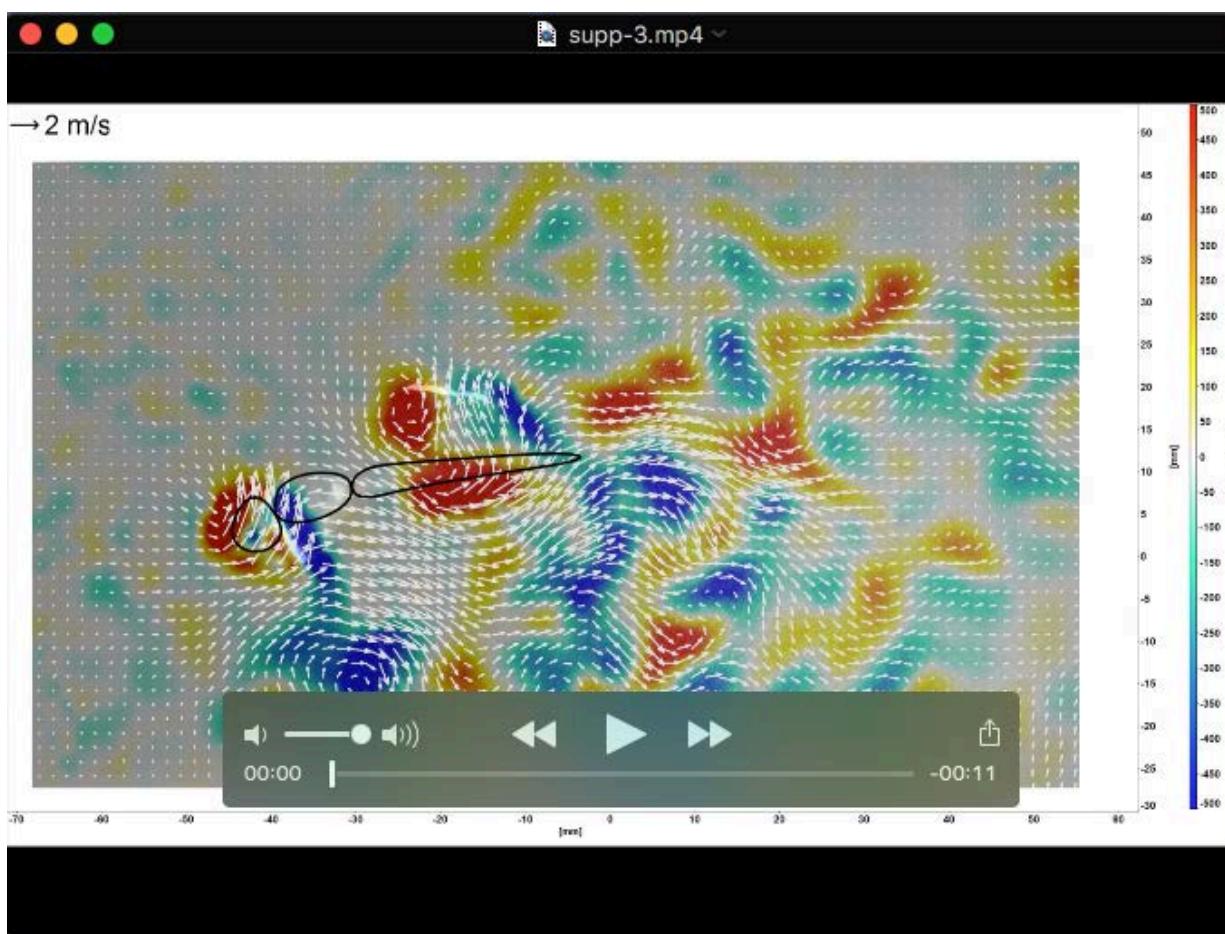
Fig. S1. Flow features of the root region. No hindwing LEV formation. The trailing edge of the hindwing generates a TEV in each stroke that forms a reverse von Kármán vortex street behind the wing.



Movie S1. Main flow features of the inner spanwise region (18% S_{HW}) throughout multiple flapping cycles.
The synergy between the forewing and hindwing LEVs are observable.



Movie S2. Main flow features in the transition region (42% S_{HW}) throughout multiple flapping cycles. The shed forewing LEV moves downstream below the down-stroking and above the up-stroking hindwing, while having minor effect on the hindwing leading edge aerodynamics. The hindwing LEV formation is delayed, as the hindwing moves through the downwash of the forewing



Movie S3. Main flow features in the outer region (78% S_{HW}) throughout multiple flapping cycles.

The LEV formation of the hindwing is suppressed by the downwash of the forewing. The hindwing captures the shed forewing vortex at the end of its stroke. This vortex is anchored to the suction surface of the hindwing and acts as a LEV.