Leading Edge

Trailing Edge

U_1

β_2

V_B

LE: flow not necessarily attached to blade

TE: flow W_2 always attached to blade

$U_{1,\theta}$ α_1

$U_{1,x}$

β_1

x

θ

Known: V_B, U_1, α_1
Find: W_1 (relative velocity)

Known: V_B, W_2 (attached flow),
  $U_{2,x}$ (constant velocity)
Unknown: U_2

Resulting Velocity Triangle
Between Leading and Trailing Edges

W_1

β_1

$U_{1,x}$

α_1

U_1

V_B

W_2

β_2

α_2

$U_{2,x}$

U_2

V_B

ΔU_θ

W_2

W_1

$U_{2,x}$

U_2

$U_{1,x}$

U_1

V_B