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**Evolving Structure of Tip-Vortex Generated by Helicopter Rotor Blade in a Hover** YONG OUN HAN, Yeungnam University, BYUNG HO PARK, YONG JOON SON — In a hover the vortex trail forms a helical trace with respect to the vertical rotor hub axis, and the slip stream becomes contracted rather drastically within one revolution of rotor blade, making the angular momentum of the tip vortex grow quickly. And, as wake age grows, tip vortex experiences diffusion, distortion and stretching during its evolving process. Vortex diffusion proceeds continuously just after matured until disappeared, but distortion and stretching eventuates far downstream with both being correlated. At this stage the helical trace cannot be maintained. Two bladed rotor provides information about vortex distortion as well as diffusion within one revolution of both blades with simplicity. This system makes it possible to observe the change of vortex structure before and after 180 degrees of wake age within one revolution of blade. It is naturally expected that tip vortex affected by the second blade may experience the distortion including the vortex diffusion. This paper aimed primarily to investigate change of vortex structures without and with the second blade effect by the use of experimental devices. It was resulted that tip vortices generated by the first blade satisfy Landgrebe's model of their locations even after they were accelerated by the second blade in downstream. Swirl velocity components follow Vatistas'  $n=2$  model on both regions without loss of vortex circulation.

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