

磁界結合方式ドローン駐機時ワイヤレス充電技術 Inductive wireless power transfer for UAV battery charging

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概要

産業用の中型・大型のドローン(UAV, unmanned aerial vehicle)は搭載する電池の容量が大きく、将来の連続的運用、無人運用に向けては、駐機時に自動的に大電力で短時間に充電できる充電システムが望まれている。数百ワット以上のドローン駐機時充電に対応する磁界結合方式のワイヤレス充電技術に関する検討内容を紹介する。

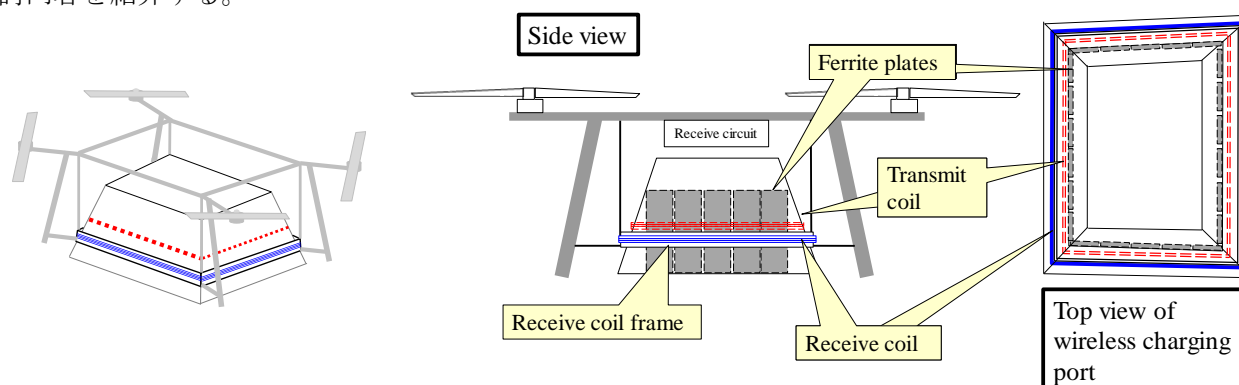


Fig. 1 Proposed frustum shape and structure of UAV wireless charging port

Table 1 Comparison between the proposed frustum-type wireless charging port and conventional flat-type

	Flat type (Conventional)	Frustum type (Our proposal)
Example of basic structure		
Misalignment on landing	Depends on landing precision of UAV	Negligible (Receiver coil frame automatically aligns its direction and fits into charging port)
Blown UAV off by turbulent wind	Probable (Need countermeasure)	Less feasible after landing in frustum
Weight of receive coil	Heavier (Ferrite tiles are desired for better coupling between coils)	Lighter (No heavy ferrite on UAV is required)
Disturbance by metal foreign object	Probable	Unfeasible (Foreign object will be fallen down by slope of frustum)

Abstract

Wireless charging stations for UAVs (unmanned aerial vehicles, drones) will be very suitable for opportunity charging between the short operations, because the autonomous self-charging will be soon expected. Since UAVs for industrial purposes are large and carry large batteries, high-power charger is preferable for fast charging. This paper summarizes the design of a prototype 450W class inductive power transfer system for application to the wireless charging port of a large UAV and briefly shows the measured result.