해상용 3축 위성 안테나의 시뮬레이션 기반 설계

김현일†(충남대) · 김성수*(충남대) · 원문철*(충남대) · 류길상*(충남대)

Simulation based Design of 3-Axes Marine Satellite Antenna

Hyun-il Kim, Sung-Soo Kim, Moon-cheol Won and Gil-sang Ryu

Key Words: Marine Satellite Antenna(해상용 위성 안테나), Dynamics and Control co-simulation (동역학 및 제어 시뮬레이션), Virtual multibody model(가상 다물체 모델)

Abstract : A three axes marine satellite antenna model has been developed for multibody dynamics and control simulations. Marine satellite antennas must have abilities to target a satellite and at the same time to stabilize the antenna dish in order to maintain its orientation toward the satellite. In order to achieve such requirements, controller algorithm, sensor modeling and motor dynamics modeling play the important to role to set up the virtual simulation model. Transfer function for sensor modeling has been deduced from the experimental test. A sensor fusion algorithm and a PIDA(Proportional, Integral, Derivative, and Acceleration) control algorithm are designed and implemented into the virtual multibody model. ADAMS and MATLAB/Simulink co-simulation has been carried out to stabilize the antenna under the 6-D.O.F ship motion. Simulation results show that the proposed control algorithm provides better performance for marine satellite antenna comparing with conventional PID control algorithm.

Taguchi 방법을 이용한 유압브레이커의 최적설계

백헌엽†(고려대) · 장효환*(고려대) · 이일재**(수산중공업)

Optimal Design of a Hydraulic Breaker using Taguchi Method

Heon Yeap Baek, Hyo Whan Chang and Il Jae Lee

Key Words: Hydraulic Breaker(유압브레이커), AMESim(AMESim 소프트웨어), Taguchi Method (다구찌방법), Impact Energy(타격에너지), Optimization(최적화).

Abstract : In this paper, the optimum design of a large-size hydraulic breaker is studied. Through sensitivity analyses, the key design parameters of the breaker are selected, which mostly affect the impact energy of the breaker. Taguchi method is used to optimize the key design parameters in order to maximize the impact energy through simulation using AMESim. As a result, the impact energy is increased by 35% compared with the present design. The pressure pulsation within the breaker is also reduced by the optimization.