SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 3 (2C)

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A COMPACT RADIO-FREQUENCY BASED RANGE SENSOR FOR COOPERATIVE MULTI-ROBOT SYSTEMS

Abstract

One of the most challenging aspects in cooperative robotics, considering surface exploration applications, is to implement a reliable location system, which must allow every single robot to locate itself as well as the other agents in an unstructured environment.

The characteristics of the Moon surface environment makes optical systems unsuitable due to the potential optical obstruction because of the presence of dust in suspension and the extreme illumination conditions originated by the absence of atmosphere.

In this paper, a system based in radio-frequency ranging is proposed, which is designed to be implemented at minimum power and mass budgets and that could enable the deployment of a large number of small robotic agents in a networked system. The novel aspect of the system is that it allows the combination of both communications and ranging in the same frequency channel.