

SPACE POWER SYMPOSIUM (C3)

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PROPOSAL ON SOLAR POWER SATELLITE OF SANDWICH TYPE IN IAA STUDY

Abstract

Humankind is now in danger of a big energy crisis. Because oil and coal as fuels for power generators are anticipated to run out from the Earth approximately fifty years after and there are a lot of risks of explosions and radioactive contaminations by the nuclear power stations. Our perspective for the energy crisis looks more serious than other countries, because we have no oil and very little coal and no places proper for new nuclear power stations in Japan. We are investigating new energy sources, for example, solar power generators, windmills, heat pumps and so on. However, these are too irregular and small generators to work as basic and steady power sources instead of the nuclear power stations. On the other hand, the Solar Power Satellite (SPS) looks an unique and hopeful candidate for electric power stations to satisfy ever-increasing energy demand on the Earth without destroying the environment. Electric power generated by huge solar paddles of the SPS at the geosynchronous orbit is transformed into microwave, which is transmitted from a large antenna to the ground. Solar cells on the ground can supply nothing in rainy and cloudy days, though they can generate electric power in the sunshine. While, the SPS can constantly generate electric power in space, where there are no rain and no cloud, except a short eclipse by the Earth. The efficiency of the power generation in space by the solar cells is estimated ten times higher than on the ground. The power density of the transmitted microwave is designed to be a low power density enough to bring no interference with the telecommunication and to give no critical effects on the ecological system on the Earth. Therefore, the SPS would be a clean substitute for the nuclear power stations without destroying the environment. The SPS study group was organized at IAA. We would like to make a proposal on the Orbital demonstration for the Solar Power Satellite of Sandwich Type. We will describe our new proposal in detail in my presentation.