

IAF EARTH OBSERVATION SYMPOSIUM (B1)  
International Cooperation in Earth Observation Missions (1)

Author: Mr. Olabamiji Olojo  
University of Strathclyde / Mechanical and Aerospace Engineering, United Kingdom,  
olajolabamiji@gmail.com

Dr. Malcolm Macdonald  
University of Strathclyde, United Kingdom, malcolm.macdonald@strath.ac.uk  
Mr. Christopher Lowe  
Advanced Space Concept Laboratory, University of Strathclyde, United Kingdom,  
christopher.lowe@strath.ac.uk

A SYSTEMS ENGINEERING APPROACH TO STUDY ROBUSTNESS OF THE EARTH  
OBSERVATION SATELLITE NETWORK FOR ADDRESSING THE UN SUSTAINABLE  
DEVELOPMENT GOALS**Abstract**

This paper presents a Systems Engineering approach, coupled with Graph Theory, to understand how Earth observation (EO) satellites meet target indicator requirements for the Sustainable Development Goals (SDGs), and the robustness of this EO system in tracking progress towards the set targets. The SDGs are made up of 17 development goals and 169 associated indicators, which address current global challenges and offer a blueprint to accomplish a sustainable future for all. Historically, countries have focused on local, rather than global needs, in an attempt to, in-effect, locally optimize EO systems. This may inadvertently affect the system-level optimization of the EO system of satellites. Through development of a graph database representing relationships between EO platforms and SDG target indicators, the system as a whole is analysed. This enables identification of dependencies between indicators and existing EO instruments and highlights potential data vulnerabilities that may exist. It is proposed that this approach could better inform development of future EO systems, enhance collaboration between organizations with shared interests and increase robustness of data acquisition