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Space Elevators and Tethers (2)

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ANALYSIS OF SPACE BASED NUCLEAR WASTE DISPOSAL WITH THE SPACE ELEVATOR

Abstract

Although space based nuclear waste disposal has been studied in depth in the past, a more detailed analysis, using a hypothetical space elevator is still missing. Being an application with high security, high mass and high volume requirements with a standardized payload, it would possibly profit from a space elevator in a unique way. First, a brief overview of the current status of nuclear waste disposal and its future trends is given. Then, past concepts for space based nuclear waste disposal are evaluated. Starting from the requirements for disposal, concepts for the transport infrastructure and the necessary hardware are developed, using a space elevator. A risk assessment, evaluating different failure modes is conducted and compared to other disposal methods. Finally, boundary conditions like political and public acceptance are addressed and a scenario developed, which might lead to a sustainable usage of the space elevator for this purpose.