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Space Elevator Tether and Space Mineral Resources (3)

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SPACE ELEVATOR. ALTERNATIVE DESIGN SOLUTIONS.

Abstract

Nowadays, all prerequisites exist to assume that construction of a Space Elevator is realizable in the near future. Meanwhile, no technologically mature way of the strength-sufficient material production has been achieved, but it only gives humanity more time for conceptual research in other areas of Space Elevator design. Still, there are many unsolved issues connected with an overall Space Elevator design and performance. Amongst the main of those are: - power transmission to climbers; - oxygen transmission to Space Elevator stations; - tether wind-driven deviation control in the atmosphere. Some of possible solutions to these issues have considerable disadvantages that significantly complicate Space Elevator's design, while to other issues, there are still no solutions proposed. This paper presents all mentioned and other issues along with possible ways of their solving by the means of Space Elevator's design alteration. Moreover, an original and efficient way of the Space Elevator's Counterweight mass increase by the means of space debris collection is suggested. It could lead to significant reduction of the seed tether's length. All these solutions combine simplicity and efficiency that can increase overall Space Elevator's safety and performance.