Exploration of Other Destinations (5)
Exploration of Other Destinations (1) (1)

Author: Dr. Ugur Guven
UN CSSTEAP, United States

CASE STUDY OF AN INTERSTELLAR MISSION: UNMANNED INTERSTELLAR PROBE USING GAS CORE NUCLEAR REACTORS WITH EARLY 21ST CENTURY TECHNOLOGY

Abstract

Le Reve d'Etoiles or the Dream of Stars has been a common dynamo for mankind since the dawn of the civilization. Since mankind has looked upon the stars, he has felt the compulsion to reach out there. However, mostly this has remained a dream rather than a reality due to limitations in current space technology. When it comes to manned missions, the farthest location that we have been able to reach is the Moon. Going to a nearby planet such as Mars with a manned mission still seems to be at least a decade away with the present technology. In addition, transportation of unmanned probes for deep space missions also has not really advanced too much as compared to the technologies of the Voyager missions' era. Current technology allows for decades to pass before it can even be possible to reach heliopause with a new probe. However, regardless of these above conditions, it is essential to explore options for interstellar missions. Consequently, in the present, the dream of stars compels many scientists to work on interstellar missions even though it may not be possible to initiate such a mission with current technology. This paper discusses the possibility of an interstellar mission. We will focus on comparing different modes of propulsion and plotting the distance, time and specific impulse for gas core nuclear propulsion system which promises to reach an interstellar destination in a reasonable amount of time. The challenges of such a mission will be presented in detail and the effects of semi relativistic speeds will be considered along with the corresponding mass expansion and time dilation. This paper will present this case study to become a reference point for similar unmanned interstellar missions in the future.