Abstract Submitted
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Pioneer Anomaly versus Viking Ranging Data JACQUES LEIBOVITZ — The amount of dark matter (DM) needed in the Solar System to explain the Pioneer anomaly (PA) appears to conflict with the ranging data from Viking [Anderson J. D. et al, 1998, Phys. Rev. Lett., **81**, 2858-2861; Anderson J. D. et al, 2002, Phys. Rev. D, **65**, 082004]. The presence of sufficient DM to produce the PA would imply that we have an error on the mass Ms of the Sun. Such error can be determined experimentally. Available data indicate that DM produces the anomaly. If confirmed, it would resolve the PA and require an explanation of the Viking ranging data. One possibility is that the speed of electromagnetic radiation through DM is a function of DM density, and increases as that density decreases. How the required functionality of DM-density, as a function of the distance Rs from the Sun, is established is derived in a companion paper. Results are discussed.

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