



Abstract Selection of Amino Acid Chirality via the Stark Effect in Stellar Environments ⁺

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An astro-biological model is presented in which atomic nuclei bound in amino acids interact via the weak interaction in stellar environments. Amino acids are preferentially oriented in high magnetic fields of certain stellar environments via the Stark effect. The coupling of atomic nuclei with non-zero magnetic moments to the molecular orbitals via the hyperfine interaction creates additional energy splittings. It has also been found that the magnetic shielding tensor can create an asymmetry in the energy states of the molecules which is dependent on chirality, and this is exploited in this model to create a chirality-dependent asymmetry in molecular states. An enantiomeric excess is subsequently created via the selective destruction and subsequent amplification of nuclei oriented in strong fields. Possible sites are proposed in which this model may exist.

Conflicts of Interest: The authors declare no conflict of interest.



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