SU(3) breaking in hyperon beta decays: a prediction for $\Xi^0 \to \Sigma^+ e\bar{\nu}$

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Abstract

On the basis of a previous analysis of hyperon semi–leptonic decay data, we present a prediction for the value of g_{A} in the $\Xi^0 \to \Sigma^+ e\bar{\nu}$ β–decay. The analysis takes into account SU(3) breaking in this sector via the inclusion of purely mass–driven corrections. A rather precise measurement of the above channel will soon be made available by the KTeV experiment at Fermilab. Since the dependence on the SU(3) parameters, F and D, is identical to that of the neutron β–decay, this measurement will provide a rather stringent test of SU(3) and the models used to describe its violation in these decays. The prediction presented here is $g_{A} = 1.17$ for the above decay, which leads to a partial rate of $0.80 \times 10^6\,\mathrm{s}^{-1}$ and thus a branching fraction of 2.3×10^{-4}.