

Publications on flavor-number violating Z decays

- Our first paper on the subject was a talk at the Ahrenschoop Symposium in November 1981 [1]. This symposium was annually organized by the Theory Group of the Institut für Hochenergiephysik der Akademie der Wissenschaften der DDR (AdW), Zeuthen, East Germany, now being part of DESY. We studied the reaction in the Standard Model and covered only the leptonic decays, e.g. $Z \rightarrow e^- \mu^+$, with massive, mixing neutrinos in the loop. The limit for small neutrino masses given there was wrong. It was derived from the correct exact formula (given in the proceedings with some misprints).
Sorry.
- Immediately after, in 1982, we wrote a longer article on the topic, which contained all the essentials of the leptonic decays, but was rejected by the referee [2]. So it remained unpublished.
The paper contains exact results, numerics, and the small neutrino mass limit.
- At a Symposium in Bad Schandau, East Germany in March 19982, the same results were presented [3].
- At the Int. Neutrino conference, Budapest, June 1982, the same results were presented [4].
- In October/November 1982, at the Ahrenschoop symposium, the decay rate for the flavor-changing Z decay into down-type quarks, e.g. $Z \rightarrow d\bar{s}$ with loops containing top quarks was presented [5].
The paper contains the exact result, numerics, and the large top mass limit ($\sim m_t^2/M_W^2, \log(m_t^2/M_W^2), \text{const.}$).
- In 1983, there appeared also the papers [6] (preprint July 1982) and [7] (preprint August 1982) on the quarkonic decays. In [5], the corresponding preprints are quoted. So, at the time of writing the proceedings contribution they have been known.
- Our journal article on the topic [8] appeared in 1984, with the preprint being dated in 1983. Here all the results on quark and leptonic decays are collected.
- Then, starting in 1999 we again devoted some time to the topic because of the paper [9]. There, the non-diagonal Z decay rates for small neutrino masses (as suggested by recent experiments) are calculated but overestimated by many orders of magnitude. This is due to a similar error as was found in that limit in [1]. A critical comment on [9] was given in [10].
- Since 1999, we studied lepton flavor violation in Z decays for the Giga-Z option of a planned Linear e^+e^- collider. The results of the Eighties were reproduced completely, and new applications including Majorana particles were included [11, 12, 13], see also [14].

- Later the very interesting scenario of susy particles and interactions was treated [15].

Literatur

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