

Z Bosons Encyclopedia Article

Z Bosons

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Contents

Z Bosons Encyclopedia Article.....	1
Contents.....	2
Z Bosons.....	3

Z Bosons

Z bosons are heavy neutral particles that mediate the weak nuclear interaction. In standard high-energy units, they have a **mass** of 92 GeV. The Z boson has no charge, and like the **photon**, it is its own **antiparticle**. Z bosons interact very much like photons, except that their heavy mass makes the range of the weak **force** much shorter. The Z bosons are some of the heaviest elementary particles, with a mass comparable to that of a Niobium **nucleus**. They have a very short lifetime of about 10^{-27} seconds, which requires that they be detected by looking for specific decay signatures in **particle detectors**. They were predicted to exist in the late 1960s and early 1970s by the newly created standard model, and were eventually detected in the mid-1980s at the large **electron positron** collider, LEP, at the European Organization for Nuclear Research (CERN) near Geneva, Switzerland.