MP 12: Superheavy bosons

Zeit: Donnerstag 14:50–15:50 Raum: HS 23

MP 12.1 Do 14:50 HS 23

superheavy boson and first step of fission — genevieve mouze[1] and •Jean-Francois Comanducci[2] — [1]universite de nice,06108 Nice cedex 2, france — [2]LE- AIEA 4 Quai Antoine Premier, 98000 Monaco

In the fission of 258Fm, the pair 132Sn- 126Sn proves that the 50 Ar cluster has interacted with the bare 82- proton phase of the 208Pb core, after having excited the four- phonon level of the oscillator present in the core. But how can two tin nuclei be formed, if 100 u-quarks are not changed into 100 d-quarks, and then 100 d-quarks are not changed into the 50 u-quarks of the two tin nuclei ? This proves not only that a W+ and a W- intervene, but also that a new heavy boson has created the W-boson pair. Clearly, this boson must have charge 0 and mass at least 160.9 GeV/c2. Its lifetime, 0.17 yoctosecond, can be deduced from the width of the mass distribution of the unique product formed at the highest total kinetic energy in asymmetric cold fission. Important is the four - phonon level, now proved thanks to a reinterpretation of the alpha-neutron coincidences of H. Han et al. of 1988.

MP 12.2 Do 15:05 HS 23

superheavy boson and prompt- neutron emission — Genevieve Mouze[1] and •Jean-Francois Comanducci[2] — [1]Universite de Nice,06108 Nice cedex 2, France — [2]LE- AIEA 4 Quai Antoine Premier, 98000 Monaco

Terrels law of 1957 on prompt-neutron emission shows that the distribution of the number of emitted neutrons has a width of 2.438 neutrons at half-maximum, as if a gauge boson having a lifetime of 0.17 yoctosecond had intervened in the fission reaction: this lifetime, shorter than that of the W and Z bosons, is pointing to a very heavy mass. But in 1962 Terrell discovered that prompt neutrons are emitted only by products of mass greater than A= 82 and A=126: it means that during 0.17 ys the fissioning nucleus consists only of neutrons, and consequently that W+ and W- bosons, created by the superheavy boson, necessarily intervened. Thus the new boson has charge zero and mass at least 160.9 Gev/c2. Coincidence experiments made by Durell in 1996 have shown that formation of a product requires the emission of a number positive or nil of neutrons. Clearly, neutron emission results from the uncertainty law and not from evaporation.

MP 12.3 Do 15:20 HS 23

superheavy boson and third step of fission — genevieve mouze[1] and •jean-francois Comanducci[2] — [1]universite de nice,06108 Nice cedex 2, france — [2]LE- AIEA 4 Quai Antoine Premier, 98000 Monaco

The separation of the two nuclei present in a pair occurs only if their Coulomb barrier can be overcome. The barrier, similar to that involved in the alpha particle emission, has to be corrected for the sphericity of the products. We have shown that only two pairs of 258Fm have a fission energy greater than their barrier [1]; all the others are confined. A nucleus can fission symmetrically only if the mass of its light product becomes equal to 126. It may be asked why 252Cf fissions asymmetrically, although a light product of mass 126 could be formed in the interaction of its 44S cluster with the bare 82-proton phase: the reason is that 126In - 126In is still confined. We propose a rational definition of the fission barrier; it is the difference between barrier Bc and fission energy Q. With our discovery of the superheavy boson, we have confirmed that fission is really a cataclysmic rearrangement. [1] G. Mouze, Bormio Intern.Winter Meeting, Università di Milano, 2005.

MP 12.4 Do 15:35 HS 23

mass and superheavy boson — Christian Ythier[1] and •Daniel Cvikevic[2] — [1]Universite de Nice, 06108 Nice cedex 2, France — [2]Bismarckstrasse 73, 70197 Stuttgart, Germany

Newtons experiment with a vessel shows that inertia is coming from the rotational motion of electrons and quarks. According to Zisman and to Feynman, this rotational motion of a charge happens essentially in the future and in the past of the ordinary 3 -D space. This future and this past are real but orthogonal to the present 3 - D space, so that the motion of a quark can be quantified in a real space rather than in a space of colour. The rotational energy of a charge is a form of energy and can be converted into kinetic energy in 3- D space. In the high-energy reaction p + p leads to pion + X, one observes a transversal impulse of 330 MeV, corresponding to the destruction of the pion, since 330 MeV/c2 is the mass of a quark. A superheavy boson having charge zero, spin maybe 2 and lifetime 0.17 yoctosecond shows itself in fission and transfer reactions, where it creates a W+, W- pair; so its mass is at least 160.9 GeV/c2.