**Erratum: Constraints on the deformation scale
of a geometry in the cotangent bundle
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J. J. Relancio and S. Liberati

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In this erratum, we review the synchrotron radiation. In the original paper, we obtained a constraint of the order of PeV. However, we did not take into account subleading terms that, due to subtle cancellations, end up making the correction to the special relativistic case completely negligible.

In order to see this explicitly, let us start from Eq. (43) of the original paper, from which we can obtain the relationship between the squared trimomentum and the energy and mass of the electron making a Taylor expansion in Λ :

$$\vec{k}^2 = k_0^2 - m^2 + \frac{k_0^3}{\Lambda} - k_0 \frac{m^2}{\Lambda}. \quad (1)$$

Taking the square root of the previous expression, one obtains (for the $1 + 1$ dimensions case)

$$k_1 = -k_0 + \frac{m^2}{2k_0} - \frac{k_0^2}{2\Lambda} + \frac{m^2}{4\Lambda}, \quad (2)$$

where we have taken the negative solution in order to obtain a positive velocity. Indeed, the velocity computed from Eq. (42) leads to

$$v = 1 - \frac{m^2}{2k_0^2} - \frac{k_0}{\Lambda} + \frac{m^2}{k_0\Lambda}, \quad (3)$$

which differs from Eq. (46) due to its last term. In the original computation of the paper, we neglected the fourth term on the right-hand side of all the previous equations, since it is obviously very small in comparison with the rest. However, in order to compute the γ factor from Eq. (47)

$$\gamma = \frac{dt}{d\tau} \approx \frac{1}{\sqrt{1 - \vec{v}^2(1 + 2k_0/\Lambda)}}, \quad (4)$$

one needs to consider the velocity squared which, using Eq. (3), becomes

$$v^2 = 1 - \frac{m^2}{k_0^2} - \frac{2k_0}{\Lambda} + \frac{3m^2}{k_0\Lambda}. \quad (5)$$

Now, when one computes $\vec{v}^2(1 + 2k_0/\Lambda)$, it is easy to see that there is a cancellation of the greater term in the velocity proportional to the inverse of the scale, $2k_0/\Lambda$, so requiring one to take into account the previously neglected term. In fact, when considering this subleading term, the γ factor from Eq. (47) changes radically its behavior:

$$\gamma = \frac{dt}{d\tau} \approx \frac{k_0}{m} \left(1 + \frac{k_0}{2\Lambda} \right), \quad (6)$$

as indeed in Eq. (47) the correction term appears with opposite sign. Hence, there is no more a maximal value of γ in terms of the electron energy k_0 .

As shown in our paper, similar cancellations arise in all the other quantities contributing to the critical frequency for the synchrotron radiation in such a way that, instead of having Eq. (52), we finally obtain

$$\omega_c = \frac{3Bek_0^2}{2m^3} \left(1 - \frac{m^2}{4k_0\Lambda} \right). \quad (7)$$

It is easy to see that the correction (Λ -suppressed) term in the above expression is completely negligible in comparison with the relativistic result. Therefore, while usually one can neglect the subleading term of Eq. (3), this term becomes crucial when evaluating the previous expressions, since the main corrections cancel out.

This cancellation is similar to the one observed in the paper when discussing possible different times of arrival for photons of different energy. This means that the constraints proposed in this paper based on our geometrical model are at most of the order of $\Lambda > \mathcal{O}(\text{keV})$.

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