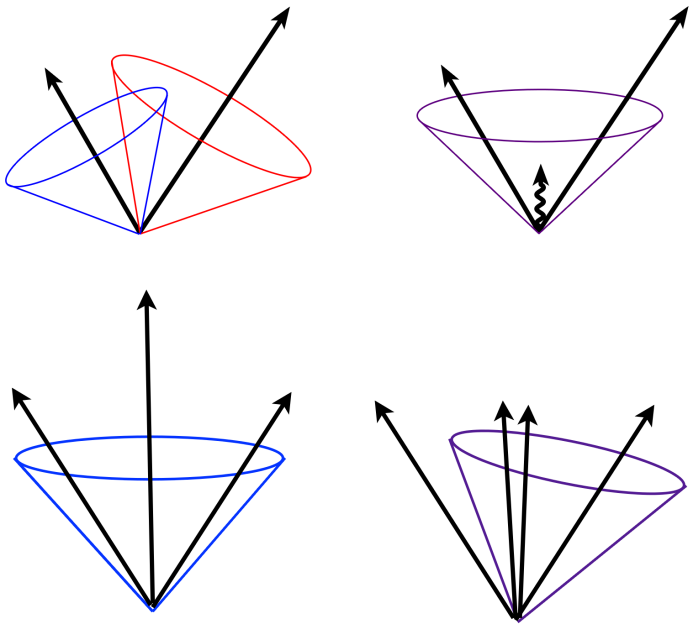

Figure 4.4. Illustration of the infrared sensitivity of a cursory designed jet algorithm (top). Illustration of the product of a collinear unsafe jet algorithm. A collinear splitting changes the number of jets (bottom).

4.4.2. Iterative Cone Algorithm

Although it lacks collinear and infrared safety, Iterative Cone (IC) algorithm is still present in the CMS official reconstruction scheme for the practical purposes of high level trigger system. It is fast and it has a local behavior, so it makes IC algorithm suitable to use in high level triggers. In order to reconstruct IC jets, an iterative procedure is followed. The particle in the event with the biggest transverse energy is taken as seed, and a cone with a radius $R = \sqrt{\delta\eta^2 + \delta\phi^2}$ is built around it. All the objects contained in that cone are merged into a proto-jet, whose direction and transverse energy of which are given as

$$E_T = \sum iE_T^i; \quad \eta = \frac{1}{E_T}\sum iE_T^i \cdot \eta_i; \quad \phi = \frac{1}{E_T}\sum iE_T^i \cdot \phi_i \tag{4.1}$$

After this determination, first proto-jet is used as the seed of the second iteration. This iterative procedure continues until the desired minimum difference between the seed