Soft Theorems from Effective Field Theory

The singular limits of massless gauge theory amplitudes are described by an effective theory, called soft-collinear effective theory (SCET). Using the power of SCET we analyze in detail the subleading soft limit of amplitudes in gauge theory. At tree-level, the subleading soft result is given by the Low-Burnett-Kroll theorem, with the angular momentum operator acting on a lower-point amplitude. At higher orders in perturbation theory, the Low-Burnett-Kroll theorem is explicitly broken by on-shell corrections. The effective theory correctly describes soft emissions to all orders in perturbation theory, generalizing the Low-Burnett-Kroll theorem. These applications are presented in a manner that illustrates the wider utility of using effective theory techniques to understand the perturbative S-matrix.

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2:00pm
401 Physical Sciences Building