Chirons, Geminions, Centauros, Decays into Pions: a Phenomenological and Theoretical Analysis (*).

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Summary. — We analyse the data on multiple production of hadrons from very-high-energy interactions, both at cosmic-ray energies and at accelerator energies. We show that these data are compatible with a discrete mass spectrum of *fireballs*, which are formed in the very-high-energy collisions and trail the colliding hadrons after the interaction. Such fireballs seem to possess different decay modes: either into pions only, or into baryons only. The decays are statistical and we derive their temperature; for instance, in the so-called « Chiron mode » the temperature is about 10 GeV, which shows that the existence of a limiting temperature of 160 MeV in high-energy collisions is violated. Moreover, we present a theoretical model for decay events like Chirons, Centauros and Geminions in terms of evaporating « *strong black-holes* ». Our analysis seems to suggest—among the others—that in the considered collisions some « phase transitions » can take place, associated with the collapse of the colliding matter inside its strong-Schwarzschild horizons. The horizon radii are in good agreement with experience and, in their turn, yield the transition temperatures through a Hawking-like relation. At these very high temperatures the emission of heavy objects is expected to be enhanced, so as it is observed experimentally. Many aspects of the data are reasonably well explained by our theoretical model.

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