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Dynamics of confined monopoles and similarities with confined quarks

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We study the annihilation of a pair of 't Hooft-Polyakov monopoles due to confinement by a string. We analyze the regime in which the scales of monopoles and strings are comparable. We compute the spectrum of the emitted gravitational waves and find it to agree with the previously calculated pointlike case for wavelengths longer than the system width and before the collision. However, we observe that in a head-on collision, monopoles are never recreated. Correspondingly, not even once the string oscillates. Instead, the system decays into waves of Higgs and gauge fields. We explain this phenomenon by the loss of coherence in the annihilation process. Due to this, the entropy suppression makes the recreation of a monopole pair highly improbable. We argue that in a similar regime, analogous behavior is expected for the heavy quarks connected by a QCD string. There too, instead of restretching a long string after the first collapse, the system hadronizes and decays in a high multiplicity of mesons and glueballs. We discuss the implications of our results.

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