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Unconventional antiferromagnetism in the presence of Dzyaloshinskii-Moriya interactions: the case of La_2CuO_4 LARA BENFATTO, CNR-INFN and University of Rome "La Sapienza", Italy, MARCELLO SILVA NETO, University of Utrecht, The Netherlands — Between the several anomalous properties of cuprates superconductors, the attention has been put recently on the magnetic properties of the undoped compounds, which display antiferromagnetism. In particular, La_2CuO_4 has been extensively investigated, and several unusual magnetic properties have been observed, as for example the temperature dependence of the uniform magnetic susceptibility and the magnetic-field dependence of the magnon gaps. Using a long-wavelength non-linear sigma model approach, we study effect of Dzyaloshinskii-Moriya interactions in the quantum Heisenberg antiferromagnet. With this technique one can easily recognize that the Dzyaloshinskii-Moriya interaction mediates an anomalous coupling between the uniform magnetic field and the antiferromagnetic order parameter. We can then provide a simple and clear explanation for all the recently reported anomalies, and we demonstrate explicitly why La_2CuO_4 can not be classified as an ordinary easy-axis antiferromagnet.

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