Correlation in time-dependent density functional theory studies of antiproton-helium collisions[1] MATTHEW BAXTER, TOM KIRCHNER, Department of Physics and Astronomy, York University, Toronto ON M3J1P3, Canada — Correlation effects are examined in the context of time-dependent density functional theory calculations of antiproton helium collisions. An approximation for the correlation potential as well as two models for the correlation integral (I_c) are explored. While one of these models (frozen correlation (FCM)) is entirely new the other is appropriated from the world of laser-induced ionization (Wilken and Bauer (WB)) [1]. Total cross sections for both single and double ionization in the range 1–2000 keV are presented. These calculations make use of the basis generator method and incorporate microscopic response. While the FCM results provide little improvement over an independent electron model description the WB model agrees quite well with experimental results for both single and double ionization. Our results also lend credence to the belief that an appropriate approximation of I_c is more important in reproducing correlation effects than the correlation potential [2].

[1] F. Wilken and D. Bauer, Phys. Rev. Lett. **97**, 203001 (2006);
[2] N. Henkel *et al.*, Phys. Rev. A **80**, 032704 (2009).

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