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**Phase switching in a voltage-biased Aharonov-Bohm interferometer** VADIM PULLER, Department of Physics, Ben-Gurion University of the Negev, Beer Sheva 84105 Israel, YIGAL MEIR, Department of Physics and The Ilse Katz Center, Ben-Gurion University of the Negev, Beer Sheva 84105 Israel — Recent experiment [Sigrist et al., Phys. Rev. Lett. **98**, 036805 (2007)] reported switches between 0 and $\pi$ in the phase of Aharonov-Bohm oscillations of the two-terminal differential conductance through a two-dot ring with increasing voltage bias. Using a simple model, where one of the dots contains multiple interacting levels, these findings are explained as a result of transport through the interferometer being dominated at different biases by quantum dot levels of different "parity" (i.e. the sign of the overlap integral between the dot state and the states in the leads). The redistribution of electron population between different levels with bias leads to the fact that the number of switching events is not necessarily equal to the number of dot levels, in agreement with experiment. For the same reason switching does not always imply that the parity of levels is strictly alternating. Lastly, it is demonstrated that the correlation between the first switching of the phase and the onset of the inelastic cotunneling, as well as the sharp (rather than gradual) change of phase when switching occurs, give reason to think that the present interpretation of the experiment is preferable to the one based on electrostatic AB effect.

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