Moments and Lanczos Study of the Anisotropic One Dimensional *XY* Model in a Skewed Magnetic Field JUN HUI LIANG[1], ZHI HUA CHENG, YICK HONG CHAN, Kingsborough Community College of CUNY, ERIC ASHENDORF, Brooklyn College, J.D. MANCINI, Kingsborough Community College of CUNY, V. FESSATIDIS, Fordham University, S.P. BOWEN, Chicago State University — Here we wish to study the ground-state and energy gap of the one dimensional spin $\frac{1}{2}$ anisotropic antiferromagnetic *XY* Heisenberg model given by

$$H = \sum_{l=1}^{N} \left[(1 + \gamma) \, S_l^x S_{l+1}^x + (1 - \gamma) \, S_l^y S_{l+1}^y - h \, (-1)^l \, S_l^z \right] \tag{1}$$

where γ is the anisotropy parameter and h is an external magnetic field. We shall investigate the ground-state energy as well as the energy gap as a function of both the anisotropy parameter as well as the number of holes as a function of the external magnetic field.

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