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We investigate the pseudo-Casimir force acting between two charged surfaces confining a single polyelectrolyte chain with opposite charge. We expand the exact free energy to the second order in the local electrostatic field as well as the replicated polymer density field around the mean-field (saddle-point) solution. The quadratic terms lead to a fluctuation interaction that is partly due to the (thermal) Casimir effect for the confined electrostatic field and partly due to the pseudo-Casimir effect due to the confined replicated polymer density field. We study the intersurface separation dependence of both effects and show that the pseudo-Casimir effect leads to a long range attraction between the surfaces that decays with an anomalous algebraic dependence of ~ 1.7, smaller than the standard exponent 2 in the case of Casimir interactions.