Abstract:An existing model for the piezoelectric d_{33}-coefficients of charged cellular polymers (ferroelectrets) is tested with experimental data obtained from different cellular polypropylene (PP) films. The model assumes the cellular films to consist of plane parallel layers of solid and gaseous material with the surfaces of the solid layers charged in a specific way. Films of the charged cellular PP are expanded by a pressure treatment. Subsequently, due to viscoelastic relaxation, the film thickness decreases, thus causing a change of Young's modulus K. Values of Y are obtained from interferometric measurements of the thickness resonance frequency. Together with the measured thickness of the solid layers and air layers in the material, the d_{33} coefficients can be determined from the model. These values are compared with experimental results for d_{33} also obtained interferometrically by means of the inverse piezoelectric effect. Good agreement between the calculated and measured d_{33} -coefficients and their change with film thickness is obtained for all investigated films.