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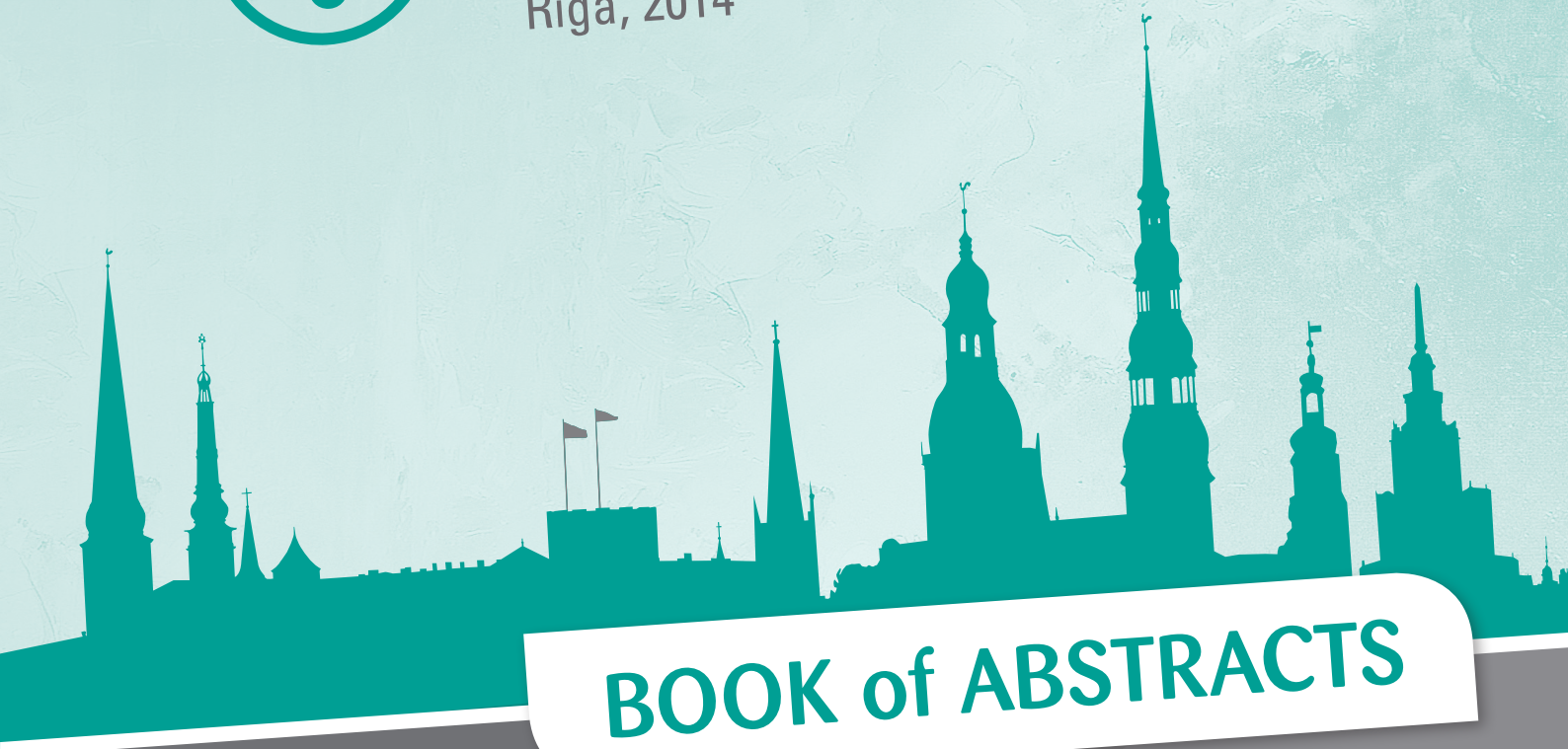

BOOK of ABSTRACTS

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Mechanical Pressure Induced Capacitance Changes of Polyisoprene/Nanostructured Carbon Black Composite Samples

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Electroconductive polyisoprene/nanostructured carbon black (PNCB) composites show pronounced piezoresistance effect when subjected to mechanical deformation [1]. This effect has been used to elaborate flexible mechanical pressure sensors [2].

To study changes in PNCB composites, which are induced by mechanical pressure, capacitance measurements of PNCB samples were conducted while applying mechanical pressure.

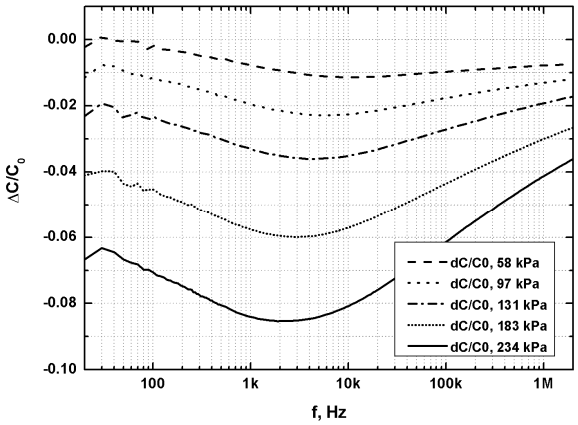

Fig.1 Frequency dependence of pressure induced relative capacitance change of PNCB composite, containing 6 phr of CB.

Relative capacitance changes depending on frequency and applied different values of mechanical pressure for PNCB sample containing 6 phr of carbon black (6 mass parts of the filler per 100 mass parts of polyisoprene) are shown in Fig.1. It can be seen that mechanical pressure reduces capacitance of the sample, but values of relative capacitance change are different at all frequencies measured (20 Hz - 2 MHz). Maximum absolute $\Delta C/C_0$ value (the maximum effect) for the sample is around 3 kHz. PNCB samples containing different amount of CB showed different values of maximum effect at different frequencies. Samples with extremely small CB filler content (3 phr CB) or extremely large CB filler content (10 phr CB) showed a decrease of capacitance change effect.

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