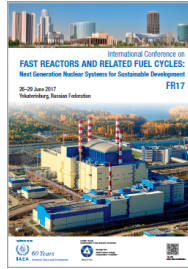


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## APPLICATION OF PHYSICAL MODELING WHEN CALIBRATING HIGH RANGE ELECTROMAGNETIC FLOWMETERS

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At high flowrates the «drift» of magnetic field characterized by the criterion  $Re_m = \mu_0 \sigma v D$  can be revealed in the readings of the electromagnetic flowmeters if its magnetic field is insufficiently extensive. The modeling of high range flowmeters presented involves using a small on scale transducer sample as compared to full scale flowmeter maintaining similarity of measuring section and magnetic field distribution. The hydrodynamic and MHD criteria ( $Re, Re_m$ ), corresponding to full scale flow conditions can be provided at much lower flowrate values. The experiments were carried out at sodium calibration test facility IRS-M, using its main loop and two parallel auxiliary loops supplied by calibrated electromagnetic flowmeters. On the model of a measuring section with the pipe DN150 at a total flowrate  $G=360$  m<sup>3</sup>/h the value  $Re_m=7,5$  has been achieved, that corresponds to parameter of the flowmeter installed in accident heat removal system of BN-800 reactor ( $G_{max} = 720$  m<sup>3</sup>/h, DN300). Calibration characteristics have been determined for different electrode pairs the longitudinal extension of magnetic field being  $L_m=0,7DN$ . An estimate of the nonlinearity introduced by the quadratic term in the dimensionless representation is obtained,  $E=k_0(1 - \alpha Re_m)Re_m$ . The coefficient  $\alpha$  can be used further to adjust the characteristic of the full scale flowmeter.

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