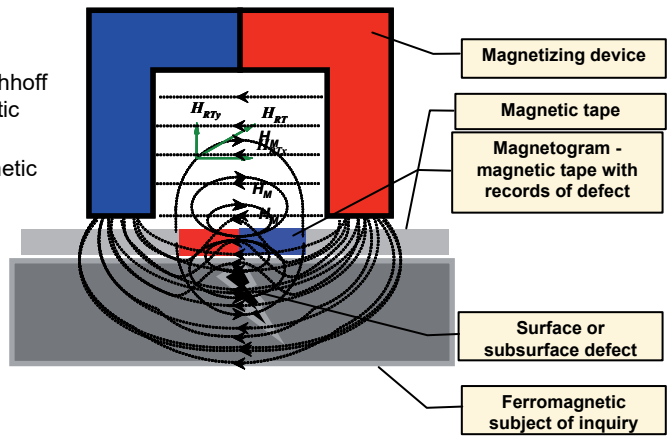
KORPORACJA WSCHÓD

MAGNETO-OPTICAL INSPECTION OF FERROMAGNETIC AND NON-FERROMAGNETIC ELECTRO-CONDUCTIVE OBJECTS' RELIEF AND SURFACE STRUCTURE

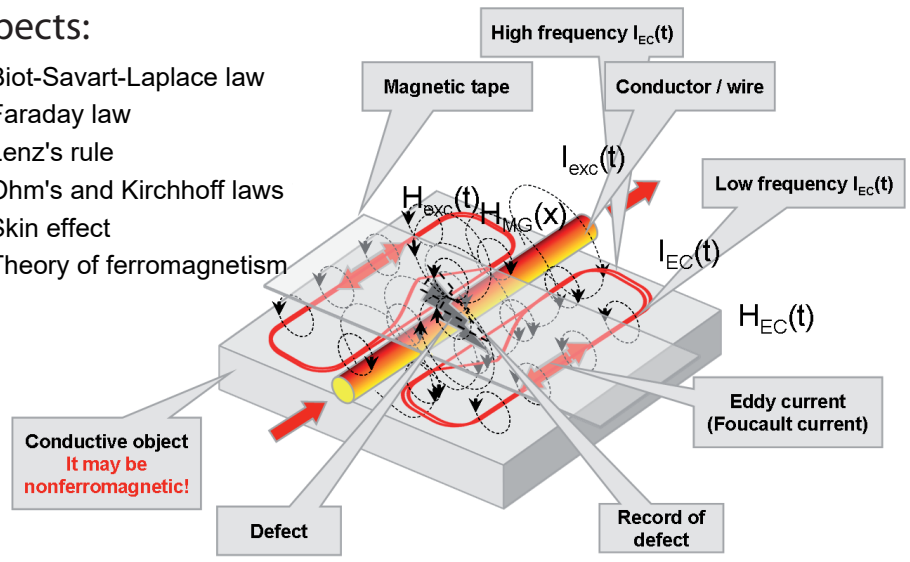
Non-destructive method for ferromagnetic and non-ferromagnetic electro-conductive samples investigation based on magneto-optical visualization of magnetograms (MOV MG) was created as magnetographic and magneto-optical methods development and completing. It allows to improve significantly important investigations parameters of near-surface layers: sensibility, resolution and validity.

- Theory of ferromagnetism
- Ohm's and Kirchhoff laws for magnetic circuits
- Theory of magnetic records

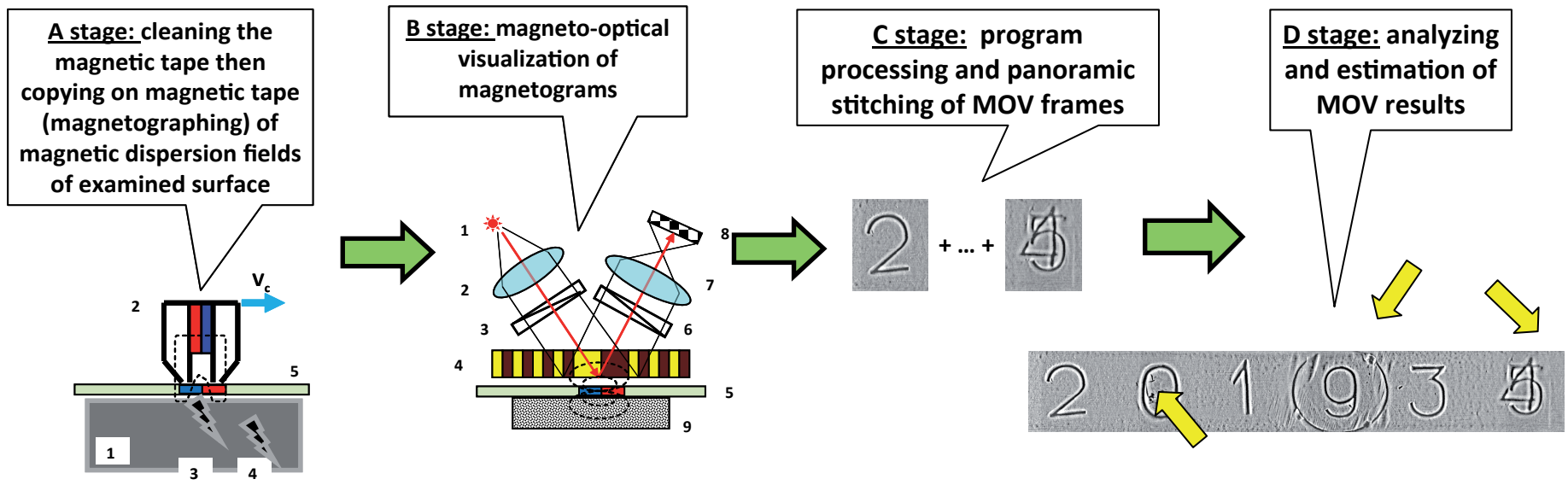


Physical aspects:

- Biot-Savart-Laplace law
- Faraday law
- Lenz's rule
- Ohm's and Kirchhoff laws
- Skin effect
- Theory of ferromagnetism



Stages of the process:



Structure scheme of MG: 1 – subject of inquiry (VIN); 2 – scanner magnetizer; 3,4 – surface and subsurface defects; 5 – magnetic tape

Structure scheme of MOV: 1 – light source; 2 – condenser; 3 – polarizer; 4 – magneto-optical converter; 5 – object of inspection with magnetized ferromagnetic inclusions; 6 – analyzer; 7- optical objective; 8 – photo receiver; 9 – pressure unit.

Reading results:

Advantages:

Main principles of MOV MG method:

- Magnetizing of local volume of surface layer – local polar excitation (LPE), recording to magnetic tape with magnetizing
- MOV of magnetic stray fields of object's magnetogram
- Signal transformation to image consisting of sequence of MOV frames, panoramic stitching of MOV frames' block

Main advantages of MOV MG method:

- Increased sensitivity of magnetographing due to magnetizing while recording
- Improvement of signal/noise ratio for surface signals due to use of flexible intermediate magnetic carrier
- Reduction of signal distortions from non-flatness of surface due to use of flexible intermediate magnetic carrier
- Increase of reproduction resolution due to MOV and improvement of clearness to visualization results due to panoramic stitching of MOV frames block
- Concordance with application conditions (considerable reduction of energy and dimensions of magnetic field generator)

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