

thermogradient galvanothermomagnetic effects; the same approach is valid to discover and evaluate the caloric surface effects and the corresponding thermogradient effects.

### 3.4. New caloric volumetric effects

There are five such effects.

**Eddy Peltier effect**  $-T \mathbf{j} \text{ rot } \mathbf{N}$  can occur, provided the medium has a specific inhomogeneity. The Nernst vector  $\mathbf{N}$  describing the properties of the medium in the magnetic field must satisfy the condition  $\text{rot } \mathbf{N} = 0$ .

**Divergent odd Peltier effect**  $-T \mathbf{j} \text{ Div}_T \hat{\alpha}^{s+}$  occurs, provided the Seebeck tensor satisfies the condition

$$\text{Div}_T \hat{\alpha}^{s-} \neq 0. \quad (1.185)$$

This effect is possible in the irregular media. If the magnetic field direction is reversed this effect changes sign.

**Odd Thomson effect**  $-T \mathbf{j} \frac{\partial}{\partial T} (\hat{\alpha}^{s+} - 2\hat{\alpha}^{s-}) \boldsymbol{\tau}$  is only possible in low-symmetry crystals where the commutation effect is observed.

**Eddy Bridgman effect**  $-T \mathbf{N} \text{ rot } \mathbf{j}$ . The specific feature of this effect is that its magnitude is proportional to  $\text{rot } \mathbf{j}$ , and not to current density  $\mathbf{j}$ . This means that to observe this effect, eddy currents must be created in the medium, e.g. Foucault currents or thermoelectric eddy currents, considered in Chapter 3.

**Deviation odd Bridgman effect**  $T \text{ Dev}(\hat{\alpha}^{s-}) : \text{Def } \mathbf{j}$  is possible, provided current distribution in the medium satisfies the condition

$$\text{Def } \mathbf{j} \neq 0. \quad (1.186)$$