



## Relativistic Physics for Teachers SS 2006

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### 1. Sequence of boosts:

- Show that the sequence of boosts along different directions matters, i.e. that

$$\Lambda(\vec{u}_1) \otimes \Lambda(\vec{u}_2) \neq \Lambda(\vec{u}_2) \otimes \Lambda(\vec{u}_1). \quad (1)$$

Hint: You may specify  $\vec{u}_1 \parallel \vec{e}_x$  and  $\vec{u}_2 \parallel \vec{e}_y$ .

- Convince yourself that the result of such a sequence can also be obtained through a sequence of boost and rotation. Try to construct this sequence explicitly for the case  $|\vec{u}_1| = |\vec{u}_2|$ .

### 2. Sequence of rotations:

Show that also for subsequent rotations around different axes the exact sequence matters.