

**ZMATH 2011a.00952**

**Embacher, Franz**

**Elements of theoretical physics. Vol. 1: Classical mechanics and special relativity. An introduction for teacher's and Bachelor's study. (Elemente der theoretischen Physik. Band 1: Klassische Mechanik und Spezielle Relativitätstheorie. Eine Einführung für das Lehramts- und Bachelorstudium.)**

Studium. Wiesbaden: Vieweg+Teubner (ISBN 978-3-8348-0920-9/pbk). xii, 350 p. (2010).

This German language book is the first item of a planned series of books about physics aimed especially for students who want to become physics teachers. It is similar in style as the other book “Mathematische Grundlagen für das Lehramtsstudium Physik” by *F. Embacher* [Wiesbaden: Vieweg+Teubner. (2008; Zbl 1200.00010; ME 2010f.01040)]. Chapter 1 is on classical (i.e. non-quantum) mechanics, chapter 2 on special relativity, and the appendix contains the solutions to the many exercises, concise information about notions like vector, matrix, spherical coordinates, differential and integral calculus, and a list of units and natural constants. The book ends with a very detailed index (26 pages), but contains no reference list for further reading. The choice of the presented material is quite usual, but the novelty in this book is that explanations are given in much more details than in other textbooks on these topics. Chapter 1 covers: Newtonian mechanics, inertial systems, rotating systems of reference, the Lagrange and the Hamilton formalism. Chapter 2 deals with the Lorentz transformations, the equivalence of mass and energy, motion of particles, and conservation laws. Of course, the usual effects like Lorentz contraction, time dilation and the twin paradox are carefully explained, too.

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*Classification:* M55 M59

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