

Journal of Zhejiang University-SCIENCE A (Applied Physics & Engineering)
ISSN 1673-565X (Print); ISSN 1862-1775 (Online)
www.zju.edu.cn/jzus; www.springerlink.com
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Editorial:

On China's High-Speed Railway Technology

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doi:10.1631/jzus.A11GT000

Energy and environmental issues have become increasingly prominent in matters of transportation. Compared with road, air, and sea transportation, railway transportation has the advantages of a large transmission capacity, with rapid, safe, and on-time travel, requiring less land resources, with lower energy consumption, less environmental pollution, and the capacity to operate under most weather conditions. In particular, high-speed railway technology has been growing rapidly. Since the world's first high-speed railway was built in Japan in 1964, more than ten countries and regions have developed high-speed railways, operating over a total of more than 10 000 km. High-speed railways not only provide the public with a new type of rapid, convenient, safe, and comfortable travel, but also greatly boost the socio-economic development of the country.

High-speed railway is a modern integrated technology, reflecting the technological developments in a given country. After nearly half a century of development, Japan, Germany, and France have made tremendous contributions to the development of the technology.

High-speed railways have long been of interest in China. In 2004, China started to explore high-speed railways based on the advanced technology found abroad. After four years of effort, many system design,

construction, manufacturing, and management techniques have been developed. In August 2008, China's first high-speed railway, the 350-km/h Beijing-Tianjin InterCity Line, was completed. Its safe operation to date indicates that the operations scheduling technology, operation control technology, public works engineering, traction power supply technology, high-speed train technology, and passenger services technology are at an advanced level.

In February 2008, in order to combine domestic research and development resources and industrial resources to develop the core technology of high-speed railways, the Chinese Ministry of Science and the Ministry of Railways set up a "China's High-Speed Train Innovation Joint Action Plan". With the support of this plan, thousands of Chinese scientists focused on the study of the key technologies and the comprehensive testing, operation control, traction power supply, and transportation organizations that advance technological expertise and development. On 30 June, 2011, the Beijing-Shanghai High-Speed Railway, the world's longest and most technologically advanced, was completed, and set a world record speed of 486.1 km/h.

However, the road of scientific research and technological progress is not easy. On 23 July, 2011, a serious accident occurred on the Ningbo-Wenzhou Line. There are still shortcomings in China's railway technologies, especially in management. After the accident, China's high-speed rail construction entered a downturn, but development will not end, since it remains essential. Through the efforts of Chinese scientists, the problems exposed in the accident will be solved and China's high-speed rail safety, comfort, and overall economic and technical level will be further enhanced.

Some of the researches related to high-speed railways have been selected for publication. This

special issue covers: high-speed train aerodynamics, traction drives, braking, control, electromagnetic compatibility, line engineering, transportation organizations, and other technical fields. Space constraints do not allow us to cover all areas of high-speed railway research, but the papers included here indicate the important progress made to date, and where future research will lead us in this challenging and exciting field.

This special issue is the first academic issue of the journal focused on high-speed railway technologies in English. On behalf of all the authors, we would like to thank the High-Speed Rail Research Center of Zhejiang University, as well as the National High-Tech R&D Program of China, the National Science and Technology Support Program of China, and the National Natural Science Foundation of China for their great supports.