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Application of vibration wire pre-alignment technology in particle accelerator engineering construction

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The role of large particle accelerators in basic research and applied research is becoming increasingly important. In recent years, which have put forward higher requirements for the accuracy and efficiency of particle accelerator alignment measurement. The vibrating wire pre-alignment system measures the magnetic center position of the magnet through the amplitude information of a beryllium copper wire excited in a magnetic field with alternating current, so as to adjust the four-pole and six-pole magnet of a magnet unit to the magnetic coaxial state based on this wire. This paper mainly describes the scheme design and system development process of the vibrating wire pre-alignment system, and conducts a series of test experiments to prove that the device is stable and reliable and meets the expected accuracy index requirements. This lays a solid technical foundation for the subsequent construction of large-scale particle accelerator projects.

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