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Application of Relative Regional Total Energy in Rotary Drums with Axial Segregation Characteristics

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Abstract : Particles with different properties tend to be unevenly distributed along an axial direction of the rotating drum, which is usually ignored. Therefore, it is important to study the relationship between axial segregation characteristics and particle crushing efficiency in longer drums. In this paper, a relative area total energy (RRTE) index is proposed, which aims to evaluate the overall crushing energy distribution characteristics. Based on numerical simulation verification, the proposed RRTE index can reflect the overall grinding effect more comprehensively, clearly representing crushing energy distribution in different drum areas. Furthermore, the proposed method is applied to the relation between axial segregation and crushing energy in drums. Compared with the radial section, the collision loss energy of the axial section can better reflect the overall crushing effect in long drums. The axial segregation characteristics directly affect the total energy distribution between medium and abrasive, reducing overall crushing efficiency. Therefore, the axial segregation characteristics should be avoided as much as possible in the crushing of the long rotary drum.

Keywords : relative regional total energy, crushing energy, axial segregation characteristics, rotary drum
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