

联合收获机惯性沉降分离室内籽粒运动规律

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摘要: 根据牛顿第二定律,建立了惯性沉降分离室内包含多因素的籽粒运动微分方程式。利用拉格朗日法的离散相模型对惯性沉降分离室内籽粒运动进行了数值计算,得到了籽粒在惯性沉降分离室内的运动轨迹,沉降、分离等运动规律,并通过数值计算得到分离室入口气流速度和籽粒初速度对分离室分离效率的影响规律。A new inertia deposition-separation chamber was adopted in 4ZTL-1800 combine harvester threshing prior to cutting to separate grain from airflow, however, particle trajectory, its separating and depositing process in the grain inertia deposition-separation chamber have not been studied so far. Trajectory of particle in the combine inertia deposition-separation chamber could be tracked by discrete phase model of Lagrange. The differential equation of grain moving in the inertia deposition-separation chamber was developed based on Newton's Second Law. The numerical simulation about particle trajectory, its' separating and depositing process in the grain inertia deposition-separation chamber were carried out for the first time. Furthermore, the effect of inlet airflow velocity and initial velocity of particle to efficiency of particles deposition and separation were also simulated and analyzed, which is beneficial to structure optimization design of the inertia deposition-separation chamber.

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