



ABSTRACT 49: PARTICLE-FLUID INTERACTION INSIDE A FAN MILL

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Fan mills, although generally used in coal comminution, show potential for the use with other minerals. They achieve high internal fluid velocities due to a spinning flywheel with its axis of revolutions normal to the flow. After hitting the flywheel, the ore is shed upward into a filter, where particles small enough are passed further on towards the next process stage. Particles considered too big are recirculated back onto the flywheel. In this work a trajectory study of copper ore particles through a fan mill was performed with the use of a commercial CFD code, ANSYS Fluent, coupled two-way with DEM (Discrete Element Method). Particles of different sizes were analysed. Results highlight ore behaviour, fluid flow conditions and mark places requiring geometrical improvements.

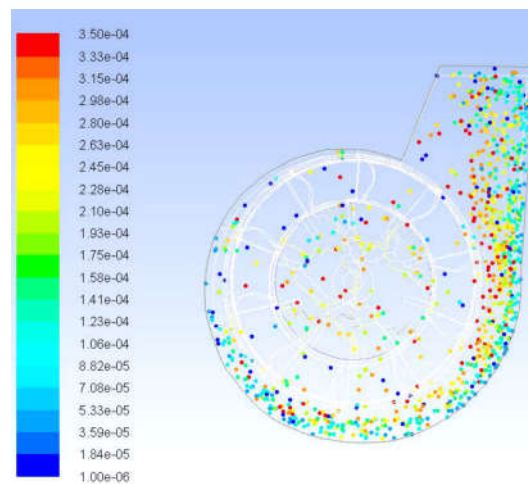


Figure: Results obtained for flywheel domain, particle coloured by diameter [m]. Small particles show an outer side dominance whilst bigger particles tend to leave the domain near the inner-middle side.