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Optimizing the efficiency of modern asynchronous machines requires the knowledge of the particular loss components. In this contribution a method shall be presented, where by the transient FEM-calculation the copper losses in the rotor bars by harmonic field effects and the consequential originating harmonic currents can be estimated. By this way the determination of the current density of the rotor current harmonics is carried out along the height of the rotor bar.

The loss distribution from the bar bottom to the bar tip is derived from the effective current density and its spatial distribution. The calculation shows, that the additional losses represent a considerable quantum of the total losses, they are partly in the range of the fundamental copper losses and therewith they have a lasting effect on the efficiency of the machine. By convenient geometrical actions a reduction of the additional losses is possible.



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