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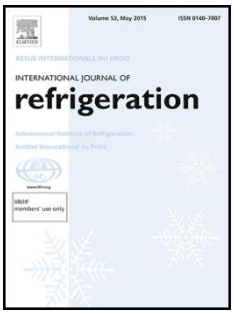

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Improving defrosting performance by controlling frost distribution to match defrosting heat distribution in frost-free household refrigerators

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Highlights

- A way of improving defrosting efficiency in frost-free refrigerators is presented.
- Frost distribution matching with heat distribution improves defrosting efficiency.
- Required frost distribution is obtained by optimizing air flow distribution.

Abstract: In the defrosting process of most of existing frost-free refrigerators, major part of the heat generated by electric heater cannot be absorbed by the frost, resulting in the raise of the energy consumption. The objective of this study is to present a new method to improve the energy efficiency in the defrosting process. Based on the idea of making the frost absorb most of the heat generated by electric heater, a new method of defrosting is proposed, and its principle is to make the defrosting process at different locations complete simultaneously by optimizing the frost mass distribution on the evaporator. In this method, the defrosting heat distribution on evaporator surface, the required frost mass distribution, the required air flow distribution and the structure of