ON THE DISTANCE BETWEEN FROBENIUS NUMBERS

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Abstract. Let \( n \geq 2 \) and \( k \geq 1 \) be integers and \( \mathbf{a} = (a_1, \ldots, a_n)^t \) be an integer vector with positive coprime entries. The \( k \)-Frobenius number \( F_k(\mathbf{a}) \) is the largest integer that cannot be represented as \( \sum_{i=1}^n a_i x_i \) with \( x_i \in \mathbb{Z}_{\geq 0} \) in at least \( k \) different ways. We study the quantity \( (F_k(\mathbf{a}) - F_1(\mathbf{a}))(a_1 \cdots a_n)^{-1/(n-1)} \) and use obtained results to improve existing upper bounds for 2-Frobenius numbers. The proofs are based on packing and covering results from the geometry of numbers.

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