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Generalized Measures of Edge Fault Tolerance in (n,k)-star Graphs

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This paper considers a kind of generalized measure $\lambda_s^{(h)}$ of fault tolerance in the (n,k)-star graph $S_{n,k}$ for $2\leqslant k \leqslant n-1$ and $0\leqslant h \leqslant n-k$, and determines $\lambda_s^{(h)}(S_{n,k}) =\min\{(n-h-1)(h+1), (n-k+1)(k-1)\}$, which implies that at least $\min\{(n-k+1)(k-1),(n-h-1)(h+1)\}$ edges of $S_{n,k}$ have to remove to get a disconnected graph that contains no vertices of degree less than h. This result shows that the (n,k)-star graph is robust when it is used to model the topological structure of a large-scale parallel processing system.

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