Research

Colloquium

Global Secure Sets of Graphs and its Applications

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摘　要：

If G is a graph and v is a vertex of G , then N(v) denotes the neighborhood of v in G and N[v] denotes the closed neighborhood of v in G . Given a nonempty subset S of V(G) , a function A defined on S is called an *attack* on S in G if A(u) ⊆ N(u)-S for any u ∈ S and A(u) ∩ A(v) = ∅ for any distinct u, v . And a function D defined on S is called a *defense* of S if D(u) ⊆ N[u] ∩ S for any u ∈ S and D(u) ∩ D(v)=∅ for any distinct u, v . The set S is called a *secure set* of G if for each attack A on S , there exists a defense D of S such that |D(u)| >= |A(u)| for any u ∈ S .

One can think the vertices of A(u) as attackers of u and those of D(u) as defenders of u . The attack is thwarted if |D(u)| >= |A(u)| . For a secure set S , each attack on S can be thwarted.

A subset D of V(G) is called a *dominating set* of G if every vertex not in D is adjacent to at least one member of D . A subset S of V(G) is called a *global secure set* of G if it is a secure set of G and also a dominating set of G .

In this talk, I will introduce the ideas used in the study of global secure sets. And I will present some recent results and applications of global secure sets.