

## Self-stabilizing algorithm for edge coloring of graphs

- R0:** if  $\exists_{i \leq D(v)} \exists_{u \in N(v)} S_v[i] = u \wedge i > D(u, v)$   
**then for**  $k = 1$  **to**  $D(v)$  **do**  
    **if**  $S_v[k] = u$  **then**  $S_v[k] = \text{null}$
- R1:** if  $\exists_{u \in N(v)} \exists_{i < j \leq D(u, v)} S_v[i] = u \wedge S_v[j] = u$   
**then for**  $k = 1$  **to**  $D(v)$  **do**  
    **if**  $S_v[k] = u$  **then**  $S_v[k] = \text{null}$
- R2:** if  $\exists_{u \in N(v)} \exists_{i < j \leq D(u, v)} S_v[i] = u \wedge S_u[j] = v$   
**then for**  $k = 1$  **to**  $D(v)$  **do**  
    **if**  $S_v[k] = u$  **then**  $S_v[k] = \text{null}$
- R3:** if  $\exists_{u \in N(v)} \exists_{i \leq D(u, v)} S_v[i] = u \wedge S_u[i] = w \wedge w \neq v$   
**then for**  $k = 1$  **to**  $D(v)$  **do**  
    **if**  $S_v[k] = u$  **then**  $S_v[k] = \text{null}$
- R4:** if  $\exists_{u \in N(v)} \exists_{i \leq D(u, v)} S_u[i] = v \wedge S_v[i] = \text{null} \wedge \forall_{j \leq D(u, v)} (j \neq i \Rightarrow (S_v[j] \neq u \wedge S_u[j] \neq v))$   
**then**  $S_v[i] = u$
- R5:** if  $\exists_{u \in N(v)} \forall_{j \leq D(u, v)} (S_v[j] \neq u \wedge S_u[j] \neq v) \wedge \exists_{i \leq D(u, v)} (S_v[i] = \text{null} \wedge S_u[i] = \text{null} \wedge \forall_{w \in N(v)} S_w[i] \neq v)$   
**then**  $S_v[i] = u$