

## Hamiltonian Related Properties with and without Faults of the Dual-Cube Interconnection Network and Their Variations

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**Abstract :** In this paper, a thorough review about dual-cubes,  $DC_n$ , the related studies and their variations are given.  $DC_n$  was introduced to be a network which retains the pleasing properties of hypercube  $Q_n$  but has a much smaller diameter. In fact, it is so constructed that the number of vertices of  $DC_n$  is equal to the number of vertices of  $Q_{2n+1}$ . However, each vertex in  $DC_n$  is adjacent to  $n + 1$  neighbors and so  $DC_n$  has  $(n + 1) \times 2^{2n}$  edges in total, which is roughly half the number of edges of  $Q_{2n+1}$ . In addition, the diameter of any  $DC_n$  is  $2n + 2$ , which is of the same order of that of  $Q_{2n+1}$ . For selfcompleteness, basic definitions, construction rules and symbols are provided. We chronicle the results, where eleven significant theorems are presented, and include some open problems at the end.

**Keywords :** dual-cubes, dual-cube extensive networks, dual-cube-like networks, hypercubes, fault-tolerant hamiltonian property

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