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**Optimizing the sacrificial anode cathodic protection of the rail canal structure in seawater using the boundary element method.** (English) Zbl 1403.74181  
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**Summary:** This paper deals with the cathodic protection design for axle/wheel and rail of 'rail-canal system' in the ocean. The cathodic protection design was carried out using the boundary element method and was verified by the physical miniature tests. The optimum cathodic protection designs were determined based on the cathodic potential distribution and anode lifetime provided by the simulation. The unprotected physical miniature experienced widespread corrosion, whereas the protected miniature was covered with calcareous deposit, indicating that the surface was fully protected from corrosion. This study demonstrated that the boundary element can be applicable to the cathodic protection design of rail-canal structure.

**MSC:**

- 74S15 Boundary element methods applied to problems in solid mechanics
- 65N38 Boundary element methods for boundary value problems involving PDEs
- 74F10 Fluid-solid interactions (including aero- and hydro-elasticity, porosity, etc.)

Cited in **3** Documents

**Keywords:**

cathodic protection; corrosion; rail canal system; boundary element method; physical miniature test

**Full Text:** [DOI](#)

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