Babinet’s Principle

“... if an opaque object is placed close to the direct ray, the effect would be exactly the same as that of an opaque screen with an aperture equal to the opaque object...”

Jacques Babinet (1837, the statement above)

Challenge

Try a numerical experiment and find an exception from Babinet’s principle.

Did you know?
Slot antennas (result of Babinet’s principle) are used in many radar systems.

Henry George Booker (1946, equivalence of dipole and slot antenna)

Arnold Sommerfeld (1949, scalar waves)

Max Born and Emil Wolf (1959, the final version)

Contemporary statement of Babinet’s principle

\[ E_i^t = ZH_i \]
\[ H_i^t = -E_i/Z \]
\[ E_s - ZH_s^t = -E_i \]
\[ H_s + E_s^t/Z = -H_i \]

Special Case

Self-complementary structures offer extremely broadband performance.

Did you know?

Slot antennas (result of Babinet’s principle) are used in many radar systems.