BROWNIAN MOTION AND THERMAL CAPACITY

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Abstract: Let W denote d-dimensional Brownian motion. We find an explicit formula for the essential supremum of Hausdorff dimension of $W(E) \cap F$, where $E \subset (0, \infty)$ and $F \subset \mathbf{R}^d$ are arbitrary nonrandom compact sets. Our formula is related intimately to the thermal capacity of Watson (1978). We prove also that when $d \geq 2$, our formula can be described in terms of the Hausdorff dimension of $E \times F$, where $E \times F$ is viewed as a subspace of space time.

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