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Dyck's surfaces, systoles, and capacities

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We prove an optimal systolic inequality for nonpositively curved Dyck's surfaces. The extremal surface is flat with eight conical singularities, six of angle theta and two of angle 9?pi - theta, for a suitable theta with cos(theta) Q (sqrt{19}). Relying on capacity estimates, we also show that the extremal surface is not conformally equivalent to the hyperbolic surface with maximal systole, yielding a first example of systolic extremality with this behavior.

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