WHEN DOES THE UNION OF RANDOM SPHERICAL CAPS BECOME CONNECTED?

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Abstract.   Drop N random caps all of the same angular radius $\theta = c\sqrt{\frac{1}{N}\log N}$ on a unit sphere. Let U denote the part of the surface covered by these caps. We prove that if $c > \sqrt{2}$, then the probability that U is connected tends to 1 as $N \to \infty$, while if $c < 1$, then the probability that U is connected tends to 0 as $N \to \infty$.

Key words and phrases: Coverage problem, random caps, asymptotic probability.