THE CORONA CONJECTURE FOR A CLASS OF INFINITELY CONNECTED DOMAINS

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1. **Statement of results.** Let D be a domain obtained from the open unit disk Δ by deleting a sequence of disjoint closed disks Δ_n converging to 0. We assume that the centers c_n and radii r_n of the Δ_n satisfy the following two conditions:

$$\text{(i)} \qquad \frac{|c_{n+1}|}{|c_n|} \leqq a < 1 \qquad \text{for all } n \geqq 1, \quad \text{and}$$

$$\text{(ii)} \qquad \sum_{n=1}^{\infty} \frac{r_n}{|c_n|} < \infty .$$

Let $H^\infty(D)$ be the uniform algebra of bounded analytic functions on D and let $\mathfrak{M}(H^\infty(D))$ be the maximal ideal space of $H^\infty(D)$. The Gleason parts of $H^\infty(D)$ are the equivalence classes in $\mathfrak{M}(H^\infty(D))$ defined by the relation $\|\phi-\psi\|<2$, where $\|\cdot\|$ is the norm in the dual of $H^\infty(D)$.

With the above assumptions on D we have the following results.

THEOREM 1. *D is dense in the maximal ideal space of $H^\infty(D)$.*

THEOREM 2. *The Gleason parts of $H^\infty(D)$ are all one-point parts or analytic disks, with the exception of the part containing D.*

The set of homomorphisms ϕ of $H^\infty(D)$ for which $\phi(z)=0$, where z is the coordinate function on D, is called the "fiber over 0," and is designated by $\mathfrak{M}_0$. $\mathfrak{M}_0$ contains the "distinguished homomorphism" ϕ_0 defined by

$$\phi_0(f) = \frac{1}{2\pi i}\int_{bD} \frac{f(z)dz}{z} .$$

If z tends to zero in such a way that

$$\lim_{N\to\infty}\left(\lim_{z\to 0}\ \inf_{n\geqq N} \frac{|z-c_n|}{r_n}\right) = \infty$$

then $f(z)$ tends to $\phi_0(f)$ for all $f\in H^\infty(D)$, that is, z tends to ϕ_0 in $\mathfrak{M}(H^\infty(D))$. ϕ_0 is in the same Gleason part as D (cf. [5]).

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