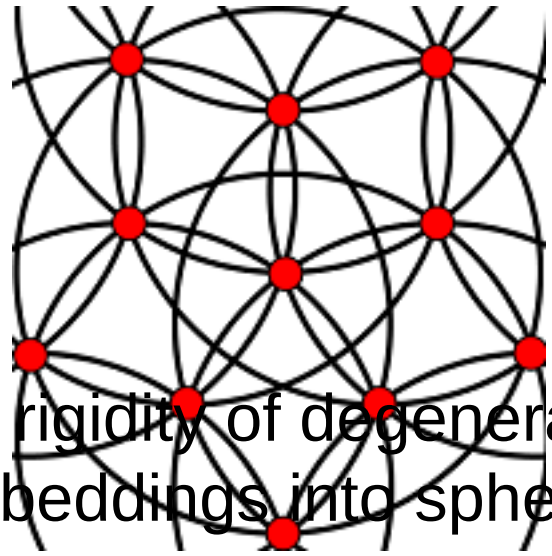
CSASC 2013



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Partial rigidity of degenerate CR embeddings into spheres

Content :

We shall consider degenerate CR embeddings f of a strictly pseudoconvex hypersurface $M\subset \mathbb C^{n+1}$ into a sphere $\mathbb S$ in a higher dimensional complex space $\bathbb C^{N+1}$. The degeneracy of the mapping f will be characterized in terms of the ranks of the CR second fundamental form and its covariant derivatives. In 2004, the speaker, together with X. Huang and D. Zaitsev, established a rigidity result for CR embeddings f into spheres in low codimensions. A key step in the proof of this result was to show that degenerate mappings are necessarily contained in a complex plane section of the target sphere (partial rigidity). In the 2004 paper, it was shown that if the total rank d of the second fundamental form and all of its covariant derivatives is $\lt n$ (here, n is the CR dimension of M), then $f(M)$ is contained in a complex plane of dimension $n+d+1$. The converse of this statement is also true, as is easy to see. When the total rank d exceeds n, it is no longer true, in general, that $f(M)$ is contained in a complex plane of dimension $n+d+1$, as can be seen by examples. In this talk, we shall show that (well, explain how) when the ranks of the second fundamental form and its covariant derivatives exceed the CR dimension n, then partial rigidity may still persist, but there is a "defect" k that arises from the ranks exceeding n such that $f(M)$ is only contained in a complex plane of dimension $n+d+k+1$. Moreover, this defect occurs in general, as is illustrated by examples.

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