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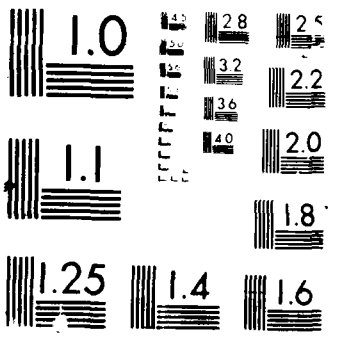
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Professor Corones

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Eleven papers were published documentary work performed under this grant, and 14 lectures were presented. Several mathematical results were obtained concerning the performance of protocols for pocket switching, local area networks, and satellite communications In particular, results concerning the stability of the exponential backoff protocol were obtained.

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Final

AMES LABORATORY Energy & Mineral Resources Research Institute

Iowa State University | Ames Iowa 50011

AFOSR-86-0259

January 15, 1987

Dr. Richard Albanese
USAFSAM/RZM
Brooks AFB, Texas 78235-5301

AFOSR-TR- 87-1406

Dear Dick:

This is a brief summary of the activity that took place under our contract AFOSR-86-0259. Relevant work proceeded along two lines during this early phase of our investigations.

First, a preliminary study of the direct and inverse scattering theory for regular shapes, spheres, and cylinders was initiated. This work was carried out in parallel with a more general look at the same problem at Purdue by Vaughn Weston (a long-time collaborator) and his student, Kevin Kreider. These two lines of work have converged in the sense that both have suggested the possibility of reconstructing the dielectric profile of a sphere (with radial dependence only) from spherical means of the scattered field. Weston has also examined the dielectric cylinder, again with radial dependence only. Kreider has just joined us as a postdoctoral fellow and is engaged in carrying out a numerical implementation for the cylinder problem. Difficulties remain, of course, such as a proof of the correct form of the reflection operator, but I would guess an implementation should be in place within six months.

Secondly, two new lines of approach for computing fields internal to a medium were developed. The first uses concepts and codes from direct scattering theory to arrive at the internal fields. The second states and solves the problem in terms of an operator that directly maps fields on the boundary of a medium, in this case a slab, into the fields internal to the medium. The first line was developed by Bob Krueger and me; the second was developed by Bob and a postdoc, Bob Ochs. Both have been implemented numerically and the results are being written up for publication.

We, of course, look forward to being able to continue these lines of investigation. You might be interested in knowing that ONR has expressed considerable interest in supporting a parallel effort germain to problems in low observable materials. I will keep you informed of how this develops.

R Mattheis

Sincerely,

Jim Corones

JPC/kp

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