

Till:
Carl Tryggers Stiftelse
för vetenskaplig forskning

Från:
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Ärende:
Ansökan om medel
för vidareutveckling
av solenergiprojekt:
Soft Point Focus

This is an application for an extension of the Soft Point Focus Project granted by the Trygger Foundation according to my application of 92-06-01. The project was started in June 1992 on a contingency basis, and continuous work has been going on since the beginning of 1993. What follows is a condensed version of the final report that will be submitted when the first phase of the project is finished in August 1993.

<u>Time period</u>	<u>Cost</u>	<u>Work Done</u>	<u>Results</u>
1992	3040 \$	Installing solar tracker. Simulating the coma of the focused solar image.	Laboratory setup. Holotrace simulations.
Jan 93	2000 \$	Design study for the experimental point focus.	New design of edge torque mirrors.
Febr. 93	3000 \$	Study of optical/mechanical diffusion methods for continuous and segmented surfaces.	Decision to proceed with continuous surfaces. Decision to investigate mechanical and "hot" diffusion.
March 93	4500 \$	Optimizing design of point focus and tracker / concentrator configuration.	Decision to use tracker for low power studies and combination structure for high power.
April 93	4570 \$	Fabrication of 2 steel mirrors for field testing.	See forthcoming final report.
May 93	invoice pending	Tuning of mirrors and assembly of experimental apparatus in combining structure. Fabrication of HOE hot diffusor.	See forthcoming final report.

Summarizing the above, we have at present used up about 165000 SEK from the 185000 that was granted by the foundation. The most important results during this phase have been:

- 1) The design and fabrication of an improved version of a point focus which we consider to be necessary for the detailed study of controlled diffusion. This more flexible design was adapted for both theoretical and practical reasons. In this new method, the mirror sheets are not clamped (i.e. fixed) at the edges, but the curvature is obtained by parallel torque bars with the straight edges optionally allowed to move freely or selectively constrained.
- 2) The decision to concentrate on the "hot diffusor" approach (i.e. diffusors close to the point focus).
- 3) Design and fabrication of the first hot diffusor, which will be tested shortly in our experimental apparatus.

Moreover, we should mention that the discrete mirror strips (discussed under point 1 of the application of last year) have been ruled out at this point due to the high projected costs of an experimental apparatus as well as the extensive amount of computer time required in order to obtain meaningful simulation data.

As mentioned above the complete report on phase 1 of the project will be submitted in August of this year.

Phase 2 of the Soft Point Focus Project Project Plan and Budget

Based on the knowledge acquired during phase 1, we see the structure of the next phase of the project in the following way:

- 1) We will concentrate on the continuation of the HOE hot diffusor exploration as well as various forms of mechanical and acoustical optical surface deflections. It should be mentioned that the theoretical groundwork for exploring the shape distortions of the continuous mirror deformations has been completed and presented in the form of a doctoral thesis (May 29, 1993), which is submitted as an appendix to this application.
- 2) We will explore the use of HOE devices to optimize the spectral input to HCPV cells in order to reduce heat loading and UV degradation.
- 3) We will continue to explore the concepts of input optical screen diffusors and optical surface diffusors.

<u>Type of cost</u>	<u>SEK</u>
Wages *	180.000
Materials	40.000
Documentation	10.000
Miscellaneous	5.000
=====	
	235.000
Moms (25%):	58.750
=====	
Total cost:	293.750

* No wages will be paid to any doctoral student.

It is my hope that the Trygger Foundation will find it possible to grant the means for a continuation of the Soft Point Focus Project in accordance with the specification presented above. As the final report of phase 1 will demonstrate, the results obtained so far constitute a promising body of knowledge which well merits a further exploration of this subject.

Stockholm June 1, 1993

Ambjörn Næve