La lettre des Syzygies

The Fluid Optics' letter 1999, September

EDITORIAL

We are happy shows you the Syzygies letter of the autumn equinox.

The first article shows the importance of the mechanical conception of the optics. Usually, the optical simulation software imports CAD files and traduces them into a simulation format. Unfortunately, the translation is not geometrically precise enough, our optical simulation software, Khnoum, does no approximation of the initial model.

The second article deals with the application of Fluid Optics to civil and military aeronautics. Thanks to its properties, Fluid optics fit very well with aeronautic lightening. The substitution of lamps by LEDs, the use of the same reflector designed for visible and night lightening simultaneously, the lighting that does not exceed the ground, are now possible with Fluid Optics.

The presentation of the Syzygies letter will change next time for a more pleasant reading.

This letter is yours. If you wish us to develop any item, please contact us by email or by our web site.

Fluid Optics' inventors

SOFTWARES

OPTICAL AND MECHANICAL SOLUTIONS

At now, to conceive a new optical element, a single optical study is not enough.

It is necessary to include the mechanical aspects of the manufacturing process.

(Next to page 2)

SUMMARY

IDEAS

FLUID OPTICS TAKE OFF

Technical problems and maintenance are very expensive in the aeronautics. Using the fluid optics, many problems are solved in a better and cheaper way. For instance, from several inexpensive light sources, we get a single light beam. Fluid optics can also eliminate the infra red, the reflectors have a better yield, a smaller shape. We get almost 4 π steradians optic sight too.

Fluid Optics allow to get a single light beam from several light sources. Thanks to this property, diodes can be used instead of incandescent lamps. As the diodes have a longer live than the usual sources, their use decrease the maintenance costs. This property allows the creation of double use projectors with night and day lights in a single projector.

Thanks to the Fluid optics, we control the light. Very high light focusing or wide diffusion are possible with optimised fluid optics. We verify every study with our simulation software before the prototype in order to get the best product for our customers.

In the case of lighted signaling, one of the problem is to send a beam as uniform as possible in a volume of half a sphere. The design facilities given by Fluid Optics combined with the performances of our software afford us to predetermine the light distributions.

The landing strip beacons built into the ground show over the ground by several millimeters and, when an airplane lands, vibrations and chocks shake the airplane and also damage the beacons. Replacement costs are not minor. Fluid Optics allow to develop a beacon type without protrusion and, of course, complying with the international standards.

Finally, the design of instrument panels lighting uniformity or in the

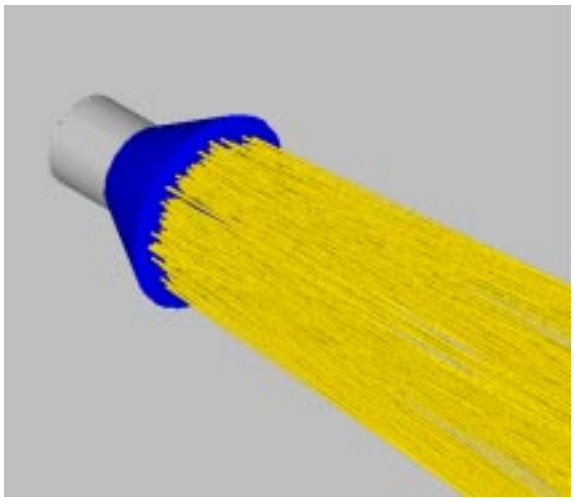
(Next to page 4)

(Folowing of page 1)

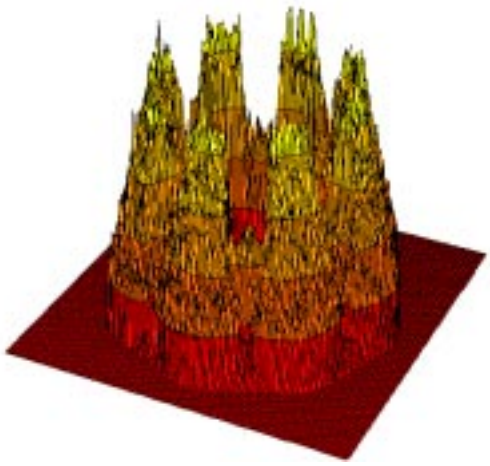
DES SOLUTIONS OPTIQUES ET MECANIQUES

To model our optics, we use a CAD/CAM software " XMOLD " which is well adapted to the mould makers. This software is developed and sold by our CAD/CAM partner XITRON France. Thanks to this partnership, our in-house simulation software KHNOUM is able to simulate optics directly in the XMOLD environment.

Then the user's productivity increases, he can study simultaneously mechanical and optical aspects of the optics. By this way, we easily eliminate the not feasible mechanical solutions. More over, as KHNOUM and XMOLD are deeply interfaced, no translation error occurs.



(KHNOUM) Simulation of a static Fluid optic focusing the light coming from severall sources into one beam.

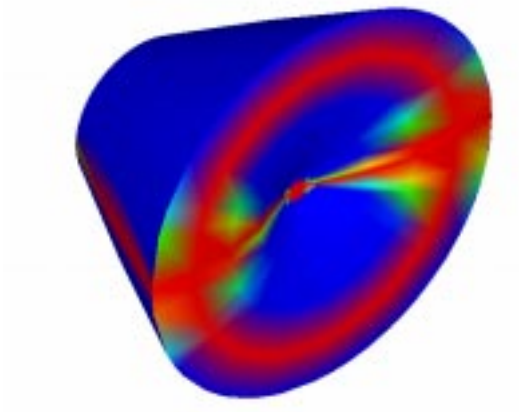


(KHNOUM) Energy shape of the output beam at the exit of the optic.

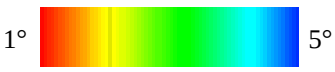
XITRON France, has integrated the OpenGL technology into XMOLD release 6. With a speed card OPENGL, this technology allows a high-speed visualisation of the models. Thus, the user can view his model at any angle and determinate if there is a mistake in the model.

Thanks to the know-how of XITRON France in prototyping and moulding, XMOLD release 6 has new features using very well the OpenGL technology.

A function to study the moulding allows to show the change of the moulding angle versus the color on all the CAM model surfaces.



(XMOLD) View of the moulding angle on the model.
moulding angle :

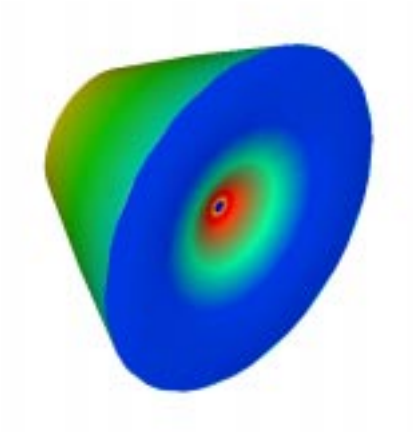


(Next to page 3)

(Following of page 2)

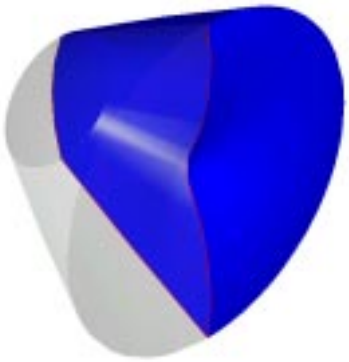
SOFTWARES

Another function for curvature radius study allows to show the change of the curvature radius versus the color on all the CAM model surfaces.



(XMOLD) Change of the curvature radius on the model.
Curvature radius

It is also possible to perform interactive dynamic cuts on the model surfaces.



Dynamic cut (XMOLD)

Now, thanks to XMOLD and KHNOUM, we can develop optic pieces with the Fluid Optics advantages and satisfying high optical performance levels and a high mechanical design level.

We remind you KHNOUM is a 3D optic simulation software, not on market, produced by the Fluid Optics' inventors. If you are interested in getting the CAD/CAM software XMOLD, please contact, stating you are introduced from the Letter of Syzygies, the XITRON France company will be pleased to answer to your expectations and questions.

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(Back to summary)

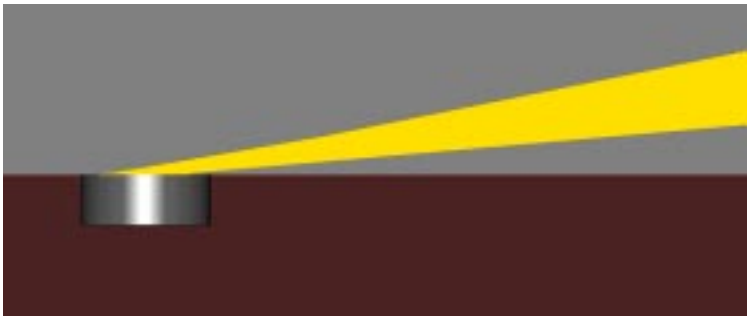
(Following of page 1)

opposite the enhancement of some elements is possible with good gains thanks to the Fluid Optics.

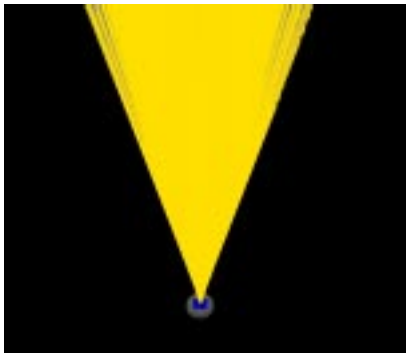
The constraints of volume and integration of an optical system in a given space is one of the advantages of the Fluid Optics. The inventors define a factor of enclosement reflecting these constraints.

The reduced volumes of the designed optic pieces afford an easier integration and material savings. The reflectors designed by the Fluid Optics inventors are not systematically circular and can allow the integration in very small volumes and produce the maximum flux. These points are very sensitive in aeronautics.

To build reflectors with reduced dimensions becomes possible thanks to the high performances given by the Fluid Optics which are 30% to 50% higher than the performances of parabolic or elliptic reflectors (CF article THEORY in the letters of December 98 and March 99).



Side view of a beacon type without protrusion
(Static Fluid optic)



top view of the same beacon

This performance increase can also allow for the same result to decrease the source power and then to save electricity.

Fluid Optics also allows to design optics in one block with a wide angle aperture. These optics allow for instance the design of omni-directional detectors. It is also possible to design an auto-director with an optic part in a single block. This system does not require the precise mechanical part initially required by the state of the Art.

Fluid Optics offers to the civil and military aeronautic domains the unique advantages to answer to the constraints and offering a much bigger integration flexibility. Fluid Optics also allows to get cost savings in terms of weight, electrical consumption and maintenance.

(Back to Summary)

NEWS

WARNING !

The Email address of Fluid Optics' inventors has changed. If you want any subject to be developed in this letter, please contact us directly at the following address:
of@optique-fluide.org

You can also contact MEGALUX, the company developing the Fluid Optics at the address :

info@megalux.com

NEXT LETTER

The next letter will be the last before year 2000. So we decided to change a little its presentation that we hope to be more pleasant. The next Letter of Syzygies will be edited for the winter solstice mid of December.

(Back to Summary)