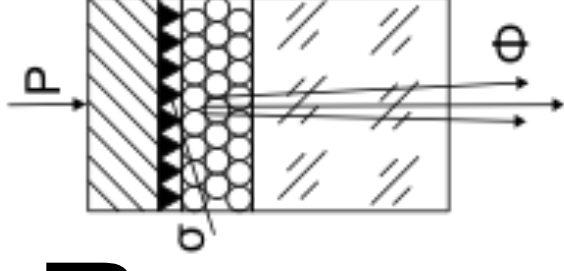
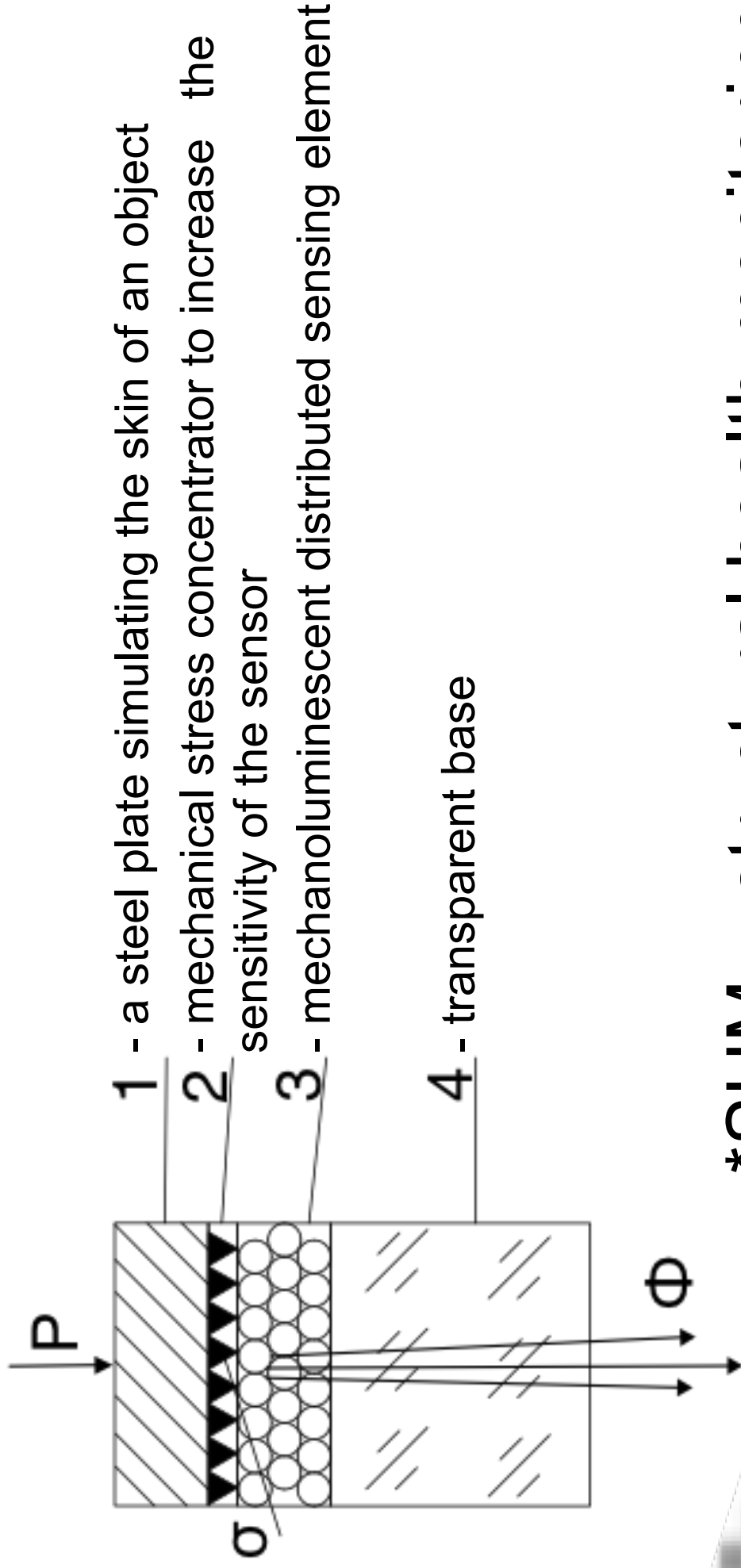


# To a question on the possibility of using mechantsoluminescent sensor elements with area- distributed sensitivity in aerospace engineering

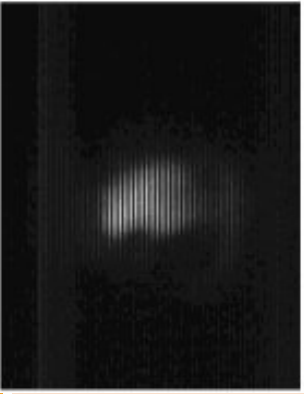
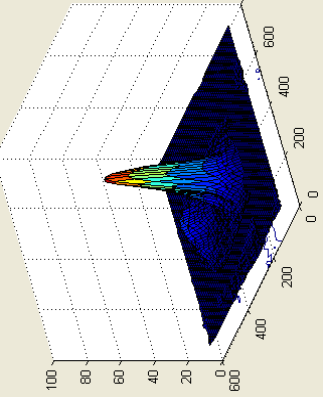
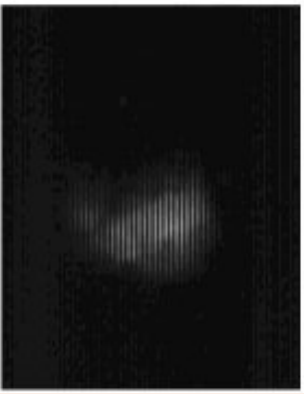
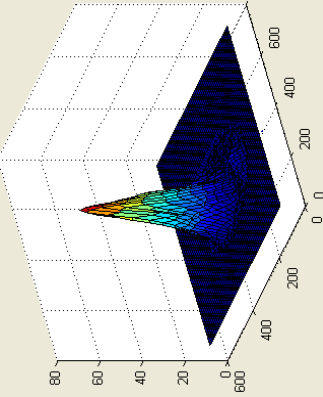

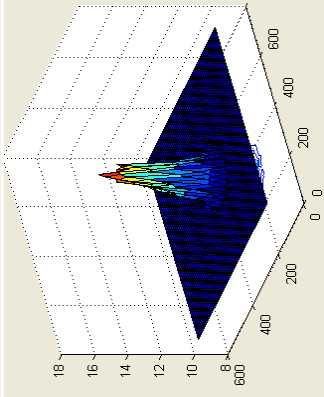


# Structure of mechanoluminescent impact sensor for SHM\* in aerospace.



\*SHM – structural health monitoring

# Results of the experiments

Impact of a metal ball falling from 1m height	Picture	Processing result
On a 1mm steel plate	 A grayscale image showing a bright, circular impact spot on a dark background. The spot has a radial gradient, being brightest in the center and fading towards the edges.	 A 3D surface plot showing the height profile of the impact. The vertical axis ranges from 0 to 100. The horizontal axes range from 0 to 600. The plot shows a sharp, narrow peak in the center, indicating a very localized impact.
On a 2mm steel plate	 A grayscale image showing a bright, circular impact spot on a dark background. The spot is slightly more diffuse than the one on the 1mm plate.	 A 3D surface plot showing the height profile of the impact. The vertical axis ranges from 0 to 80. The horizontal axes range from 0 to 600. The plot shows a sharp peak in the center, similar to the 1mm plate but with a slightly lower maximum height.
On a 6mm steel plate	 A grayscale image showing a bright, circular impact spot on a dark background. A white, irregularly shaped mask is overlaid on the spot, likely used for segmentation or analysis.	 A 3D surface plot showing the height profile of the impact. The vertical axis ranges from 0 to 18. The horizontal axes range from 0 to 600. The plot shows a very low, broad peak in the center, indicating a much shallower impact compared to the thinner plates.

# Mechanoluminescent composite SHM panel with side input of radiation into the light guides

- 1-impact object;
- 2-protective coating;
- 3-mechanoluminophore;
- 4-transparent substrate;
- 5-optical fibers with side input of light (columns);
- 6-optical fibers with side input of light (rows);
- 7-base;
- 8-optical fibers with end output of glow;
- 9-multi-element linear photodetector;
- 10-signal processing unit.

