

## Ladar sensing av small objects

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### Laser radar application tests



This is a test related to the application to see persons in railroad areas beside station platforms where it can happen accidents. It also shows the capability to see small objects on any flat surface like streets and air field runways in an automatic and reliable way.

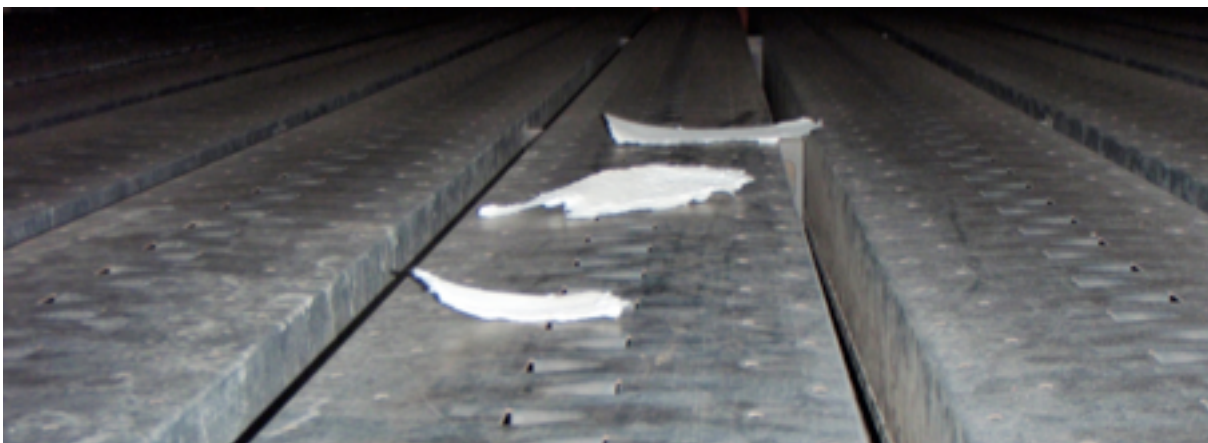
This test was done inside a machine in a process industry where there was a perfect control of the area and it was flat without any disturbances.

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Laser radar system. This is an internal universal demo and test set up where we test new applications and sensors when needed.



Test objects was small pieces of papers laying on a very flat surface. The height over the surface was less 10 mm and the laser radar can only see the edges of the paper pieces on the thick steel plates. Photo from side of scanned area.

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Here we show the view that the laser radar shall detect from its position.

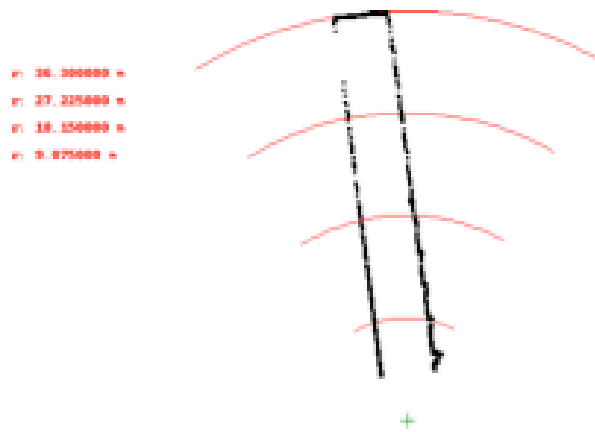
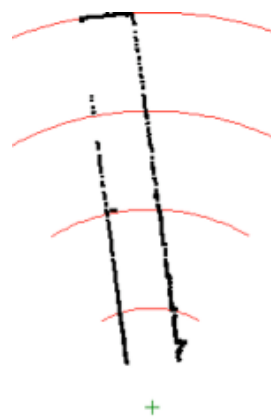


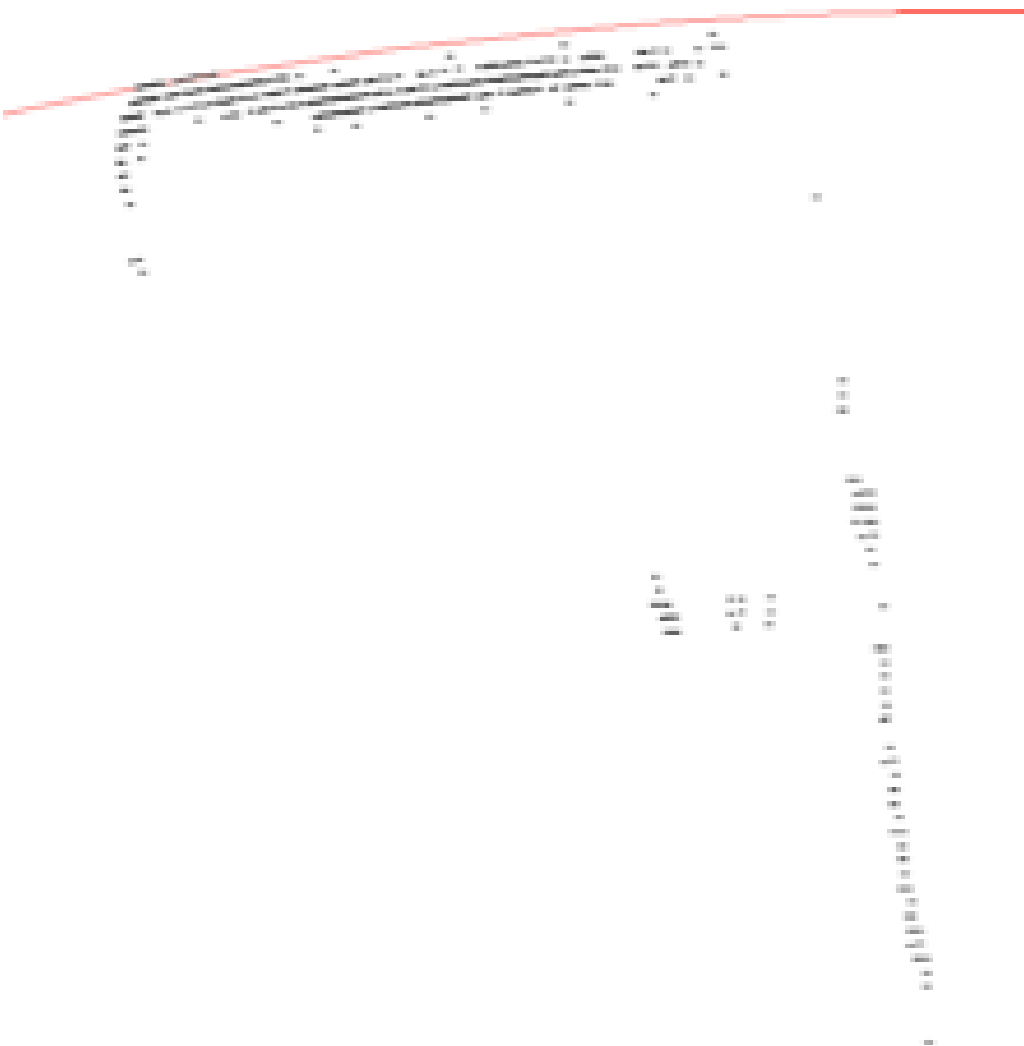
Image of scanned area for tests. We have a 6 meter in width and 40 meter in length



Same area with plot showing an object in centre at left side. The large area makes it a bit hard to see with fine resolution.

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Enlargement of view where we have 3 objects at slightly right side



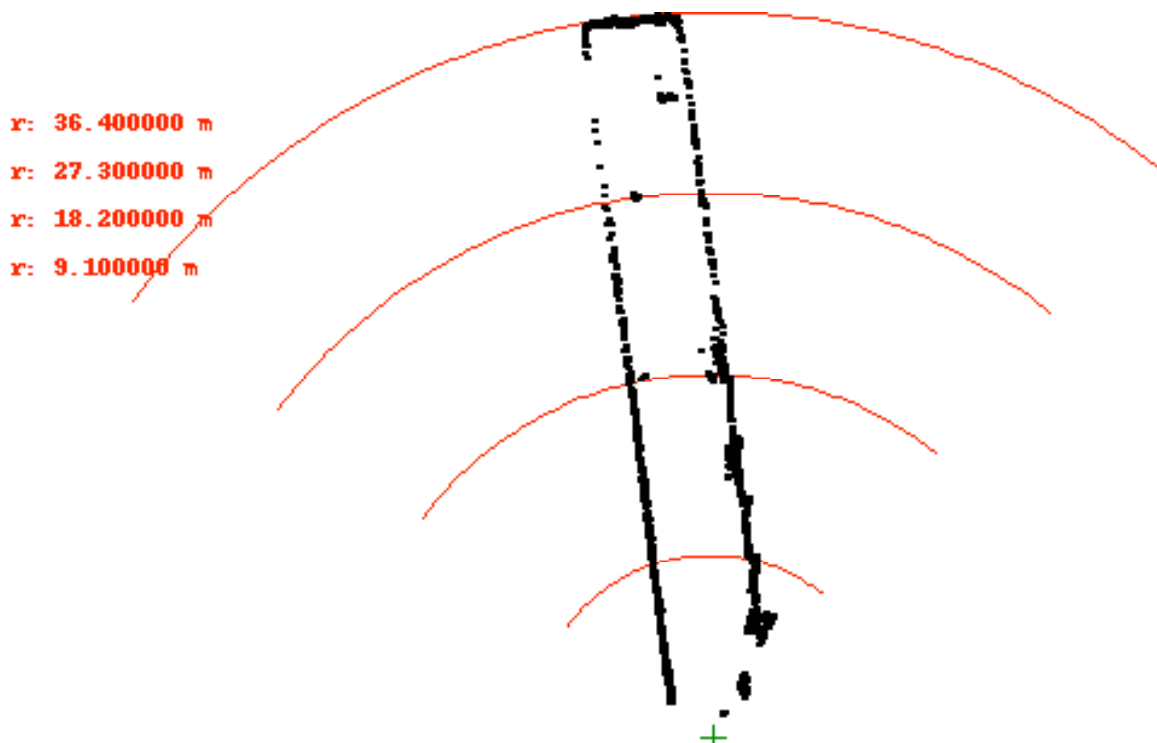
Real view of detected parts on the steel surface.

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Dimensions of the 4 pieces are 3 , 5 , 7 and 9 cm in area and about 10-15 mm in height. They are located almost 35 meter from the laser scanner.



### Analyze in short

Beam of laser is in this case 20x50 mm and we can see a 30 mm object at 30 meter. Here we used the smaller 150 meter scanner and we have a resolution of about 50% of the beam size. Signal is here very strong. In rail road applications we have the 500 meter unit that have same shape of beam but tripled range.

Beam at 100 meter is 20 mm in height and 220 mm in width like a stripe. This is very good as beam can be parallel to the surface / rail top and see what must be detected.

We can predict that detecting a person at 100 meter would be OK with margins. If we



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say person is 50x400 mm over rail top this match a 200 meter beam shape and seems possible.

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