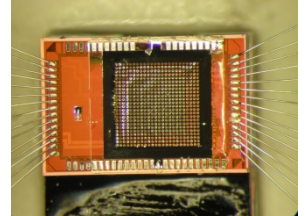


Measuring a particle track in 1 μl of gas

Supervisor: Fred Hartjes

At Nikhef we have built the micro-volume gaseous detector Gossipo to reconstruct tracks of charged particles. The detector consists of a 16 x 16 matrix pixel chip with a 0.8 mm² sensitive area. The ionization that is created in the 1.3 mm high gas layer is collected by the pixel chip to reconstruct the trajectory of the particle. The combination of ultra-low diffusion gas, a very fine pixel pitch (55 μm) and a high resolution drift time measurement is expected to yield a resolution that has never achieved before with this type of detector.



July 2013 we have organised a testbeam experiment at DESY (Hamburg) to measure its performance. A master student may contribute to one or more of the open questions:

Hardware

1. Can we solve the problem of the poorly working fast counter?
2. What are the best settings of the chip (supply voltage, timing control signals, duty cycle clock,...)?
3. Can we improve the communication with the FPGA controller?

Analysis of the July 2013 data

1. Can we improve the angular resolution by applying appropriate cuts?
2. Is there a correlation between the position of the track and the measured angle, i.e. is the drift field not well homogeneous?

