Date: Mon, 28 Aug 2006 13:24:22 -0400 (EDT)
From: "Dipangkar Dutta" <ddutta@tunl.duke.edu> Block Address
Subject: AW: Diamond pixel detectors (fwd)
To: dd285@msstate.edu

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---------- Forwarded message ----------
Date: Thu, 27 Jul 2006 22:01:38 +0200
From: Berdermann Eleni <E.Berdermann@gsi.de>
To: Dipangkar Dutta <ddutta@tunl.duke.edu>
Subject: AW: Diamond pixel detectors

Dear Dr. Dutta,

since I'm not familiar with your special "Compton Polarimetry" application,
I should first understand better your measurement in order to answer correctly:

1) Those "recoil electrons" you want to detect with the diamond detector,
are they the scattered beam electrons on the laser photons?

2) What is the energy of those electrons?

3) What is the expected electron rate/strip to be detected?

The latest is the crucial parameter defining the type and thickness of CVD diamond you could try to use, and the corresponding electronics too.

The status of CVD diamond detectors is a long story, because the versatility and
rad. hardness of the material led to a very broad range of detector applications in the past.
You can find plenty of literature just asking Google.

However, no CVD diamond detector for such applications exists "ready to used" on the market.
The procedure is to buy first a suitable sample.
Our supplier is: Element Six, Ascot, UK.
If you like you may use my name for getting easier contact;
the contact person for detectors there is Kevin Oliver, email:
kevin.oliver@e6.com , unfortunately currently in vacation.

Second: to find a manufacturer able and willing to do the photolithography needed for the strip-electrode design. Your required position resolution is no problem. It is in principle rather similar procedure as for silicon detectors, however, not many companies like to do.
You may ask Kevin Oliver too; probably they can take care about masks and metallisation.
My recommendation however is: if you never have work with a CVD diamond detector, don't start with a complicated micro-strip design. Go familiar with it with simple dot electrodes, and remetallize it afterwards.

Concerning the costs: again, it belongs strongly to the type of diamond you need.

Thats why, please tell me first a bit more about the parameters of the electrons
you like to detect. I can then be of better assistance.

Best regards

Elèni Berdermann

> -----Ursprüngliche Nachricht-----
> Von: Dipangkar Dutta [mailto:ddutta@tunl.duke.edu]
> Gesendet: Donnerstag, 27. Juli 2006 17:12

> An: Berdermann Eleni
> Betreff: Diamond pixel detectors
>
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>
> Dear Dr. Berdermann,
> I was wondering if we could ask you a few questions about
> CVD Diamond
> detectors. We are interested in using the diamond detectors
> as a recoil electron detector in a Compton Polarimeter at
> Jefferson Lab. The
> sensitive area will be 3x3~cm and it needs ~ 250 micron
> resolution in the transverse direction. Our main concern is
> radiation hardness. It seems the
> diamond detector would be ideal for our application, however
> it was not clear to us what is the current status of R&D for
> these detectors and if we can buy
> some diamond strip detectors. We would be very grateful if
> you could guide
> us to where we can get such detectors and how much they might cost.
>
> Thank you very much
> Dipangkar Dutta
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