Date: Thu, 11 Apr 2019 03:55:05 +0200  
From: Kyong Sei Lee <kyong.sei.lee@cern.ch>  
To: Maxime GOUZEVITCH <mgouzevi@ipnl.in2p3.fr>  
Cc: "mirabito@ipnl.in2p3.fr" <mirabito@ipnl.in2p3.fr>,  
     "laktineh@ipnl.in2p3.fr" <laktineh@ipnl.in2p3.fr>,  
     "c.combaret@ipnl.in2p3.fr" <c.combaret@ipnl.in2p3.fr>,  
     Konstantin SHCHABLO <shchablo@ipnl.in2p3.fr>,  
     Salvatore Buontempo <Salvatore.Buontempo@cern.ch>,  
     Nikolaos Zaganidis <Nicolas.Zaganidis@cern.ch>,  
     Ian Crotty <ian.crotty@cern.ch>  
Subject: RE: Resistor  
  
Dear  
  
I am sorry to say that my calculation for the capacitance of a 1.4-mm thick 1.5 m^2 gap seems to be wrong. It should be ~ 100 nF instead of 9.3 nF. Please check the caluculation. I was looking for  a 1 ms time constant. My idea to for testing it with a fastest way is to serially connect a relevant resistor to the HV cable core before connecting a Jupitor HV connector. Same job for the ground line of the HV cable.  
  
I am just suggesting a discussion for the feasibility. To get Tau ~ 1 ms, the resistors should be 10 kOhm right? The time constant will be smaller with smaller resistance of the resistors. The power grade for the resistors should be 1 W. Then, we need four 10 kOhm resistors for two gas gaps. Connecting resistors like this way could be effective to only small chambers but not for large size chambers. I just got fairely good improvement on these small chambers.  
  
Parameters for the small chambers at KODEL.  
1. Capacitance of two gaps (area of two gaps = 740 cm^2) in a chamber = 5 nF (not 0.5 nF)  
2. Time constant tau = RC = 27 kOhm x 5 nF = 0.14 ms  
3. Threshold at 0.2 mV (~ 30 fC) for all channels.  
4. Used coaxial cables to read signals.  
  
Cheers, Kyongsei  
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From: Maxime GOUZEVITCH [mgouzevi@ipnl.in2p3.fr]  
Sent: 10 April 2019 21:32  
To: Kyong Sei Lee  
Cc: mirabito@ipnl.in2p3.fr; laktineh@ipnl.in2p3.fr; c.combaret@ipnl.in2p3.fr; Konstantin SHCHABLO; Salvatore Buontempo; Nikolaos Zaganidis; Ian Crotty  
Subject: Re: Resistor  
  
Hi,  
  
so who could do a 100 kOhm resistor at the patch pannel? I would be happy to watch but have no idea how to proceed.  
  
max  
  
----- Mail original -----  
De: "Kyong Sei Lee" <kyong.sei.lee@cern.ch>  
À: "Maxime GOUZEVITCH" <mgouzevi@ipnl.in2p3.fr>, mirabito@ipnl.in2p3.fr, laktineh@ipnl.in2p3.fr, "c combaret" <c.combaret@ipnl.in2p3.fr>, "Konstantin SHCHABLO" <shchablo@ipnl.in2p3.fr>, "Salvatore Buontempo" <Salvatore.Buontempo@cern.ch>, "Nikolaos Zaganidis" <Nicolas.Zaganidis@cern.ch>, "Ian Crotty" <ian.crotty@cern.ch>  
Envoyé: Mercredi 10 Avril 2019 18:00:10  
Objet: RE: Resistor  
  
Dear Maxime,  
  
Yes 1 MOhm is too large. The total voltage drop along the HV and GND lines will be 200 V with 100 uA. If the resistors are 100 kOhm, the voltage drop will be at best 20 V with 100 uA.  I am just asking discussing my opinion among us. Of course, I am not asking dismantle the chamber. I don't what kind filter you have used. Please discuss this with Laurant and Christopher. The time constant with two 100 kOhm resistors per gap (9.2 nF for RE3.1) is 0.92 ms.  
  
1. The active area for the two small chambers (one constructed with 55 kOhm, the other with 900 kOhm) being tested at KODEL is just 370 cm^2 (capacitance ~ 0.46 nF).  
2.  I connected both gaps in a single HV lines. I connected 27 kOhm resistors on both HV line and the current return GND line in series.  
3. The 27 kohm resistors were attached at the patch panel side of each chamber, not directly to the gaps.  
4. The difference in the active areas between RE3/1 and these small chambers is a factor 20. The time constant = 27 kOhm x 0.46 nF = 11 ms.  
5. I set the threshold at 0.2 mV (~ 30 fC) for all channels.  
6. I used coaxial cables to read signals.  
7. Before attaching the resistors, I too the data masking the last two channel sitting on the HV/GND connections on each chamber to block the noise pedestals.  
  
The two files are noise profiles at their WPs for these chambers after attaching the 27 kOhm resistors. The noise pedestals in the last channels have well suppressed.  If you ask me, I can send you the all root data files. Th = 200 uV is the marginal value when using coaxial signal cables. But, the noise level still stay ~ 3 Hz cm^-2. I think the majority near the edges of the chambers is cable pickup noises when with Th = 200 uV.  
  
Cheers, Kyongsei  
  
  
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From: Maxime GOUZEVITCH [mgouzevi@ipnl.in2p3.fr]  
Sent: 10 April 2019 11:20  
To: mirabito@ipnl.in2p3.fr; laktineh@ipnl.in2p3.fr; c.combaret@ipnl.in2p3.fr; Konstantin SHCHABLO; Salvatore Buontempo; Nikolaos Zaganidis; Kyong Sei Lee; Ian Crotty  
Subject: Resistor  
  
Dear All,  
  
I would like to see if we can implement Kyong Sei idea. A priori we have  
a filter close to the HV crate but then a long cable between the filter  
and the Gap. If I understand well we have to add the Resistor as close  
as possible to the Gap. But I would suggest to not dismantle the  
chamber. If somebody knows how to proceed we see no objection at the  
IPNL. We have to decide which resistor to add 1 MOhm may induce a rise  
of WP by 100 V. Quickly checking  
  
OhmEffect = (100 muA)^2\*1MOhm = 0.01 J shall be ok.  
  
Max  
  
==============  
  
Below IPNL comments:  
  
and don’t forget that if you add one resistor on the HV side and one at the GND side, you double ur voltage drop  
  
Christophe  
  
Le 10 avr. 2019 à 11:13, Laurent MIRABITO<mirabito@ipnl.in2p3.fr>  a écrit :  
  
   Hi Maxime,  
  
It's why we are suggesting 100 kOhm that will limit to 1 ms but decrease the beam current effect to few tenth of V.  
  
   Cheers  
   Laurent