Information Classification: COMPANY RESTRICTED

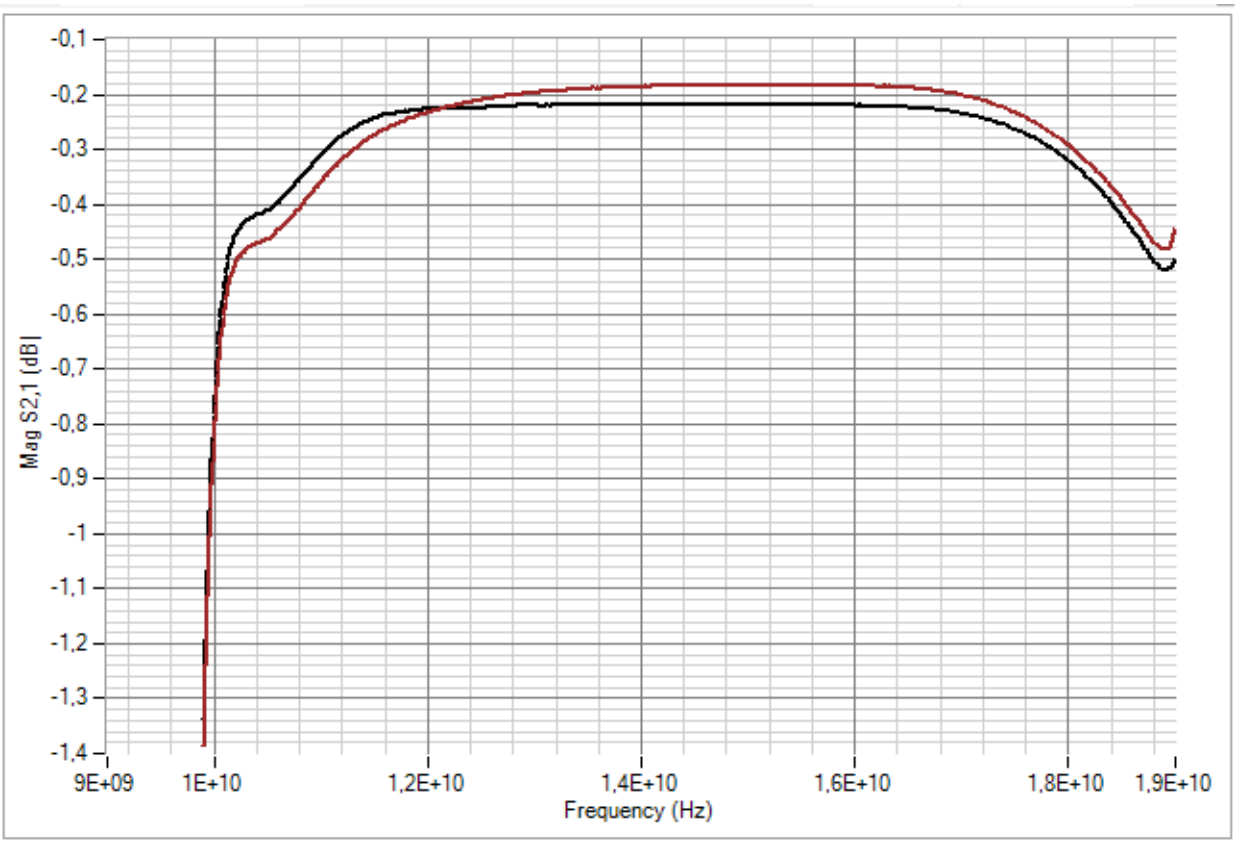
Re: S2P extractor app /cr/

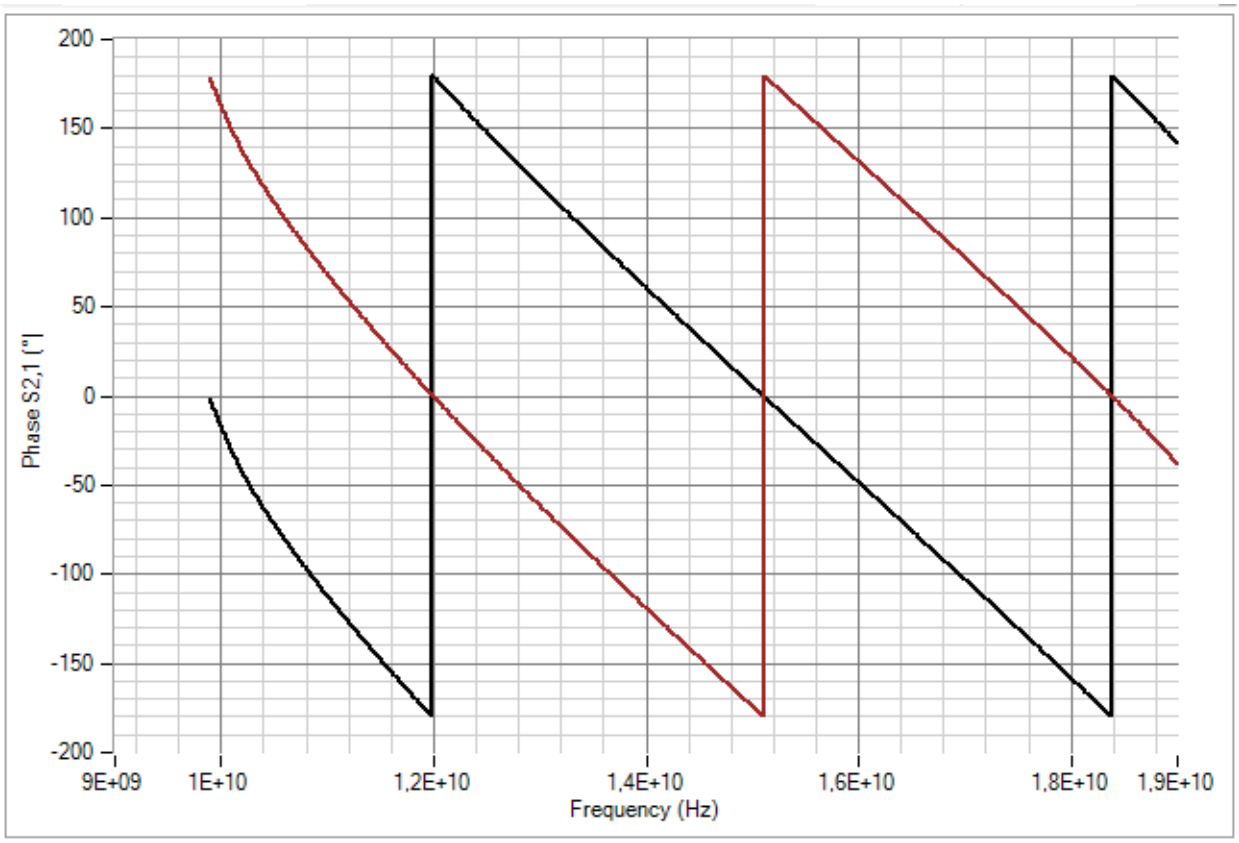
Frederic Molina to: Mike Leffel, Nick Lalic 12/08/2015 08:39 AM

Hello Mike and Nick,

Please let's me clarify the situation :
In the email that I sent yesterday, I compared your macros over 2 tests :
Test 1 :
With Mike's macro I used 2 **OSM** (I used OSM, because I wanted to check if your macro worked correctly with OSM cal which is the need of our customer).
With Nick's macro I used 2 **UOSM** (because OSM is not supported yet).
The amplitude of the extracted s 2p was very similar , but not exactly identical because the calibration was not the same ! The problem was the Phase.

Black trace = Nick's macro / Brown trace = Mike's macro



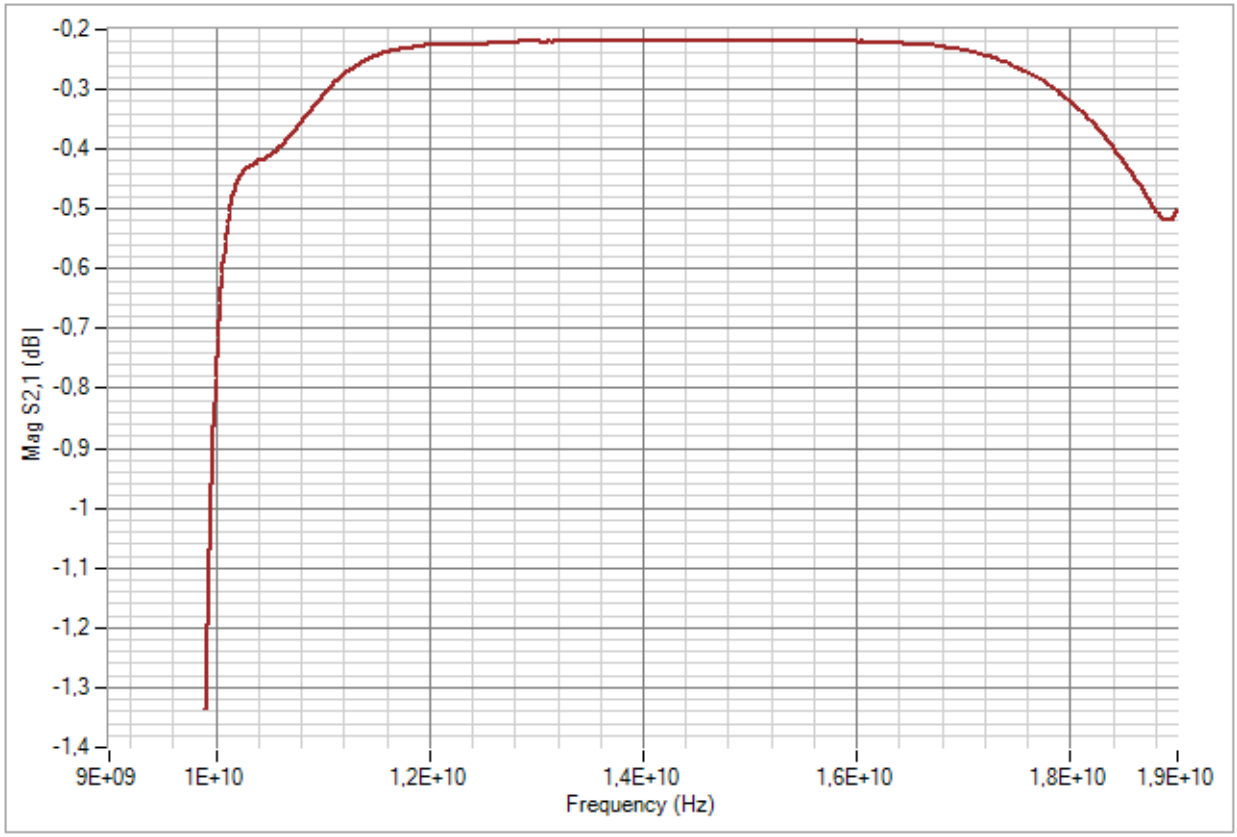


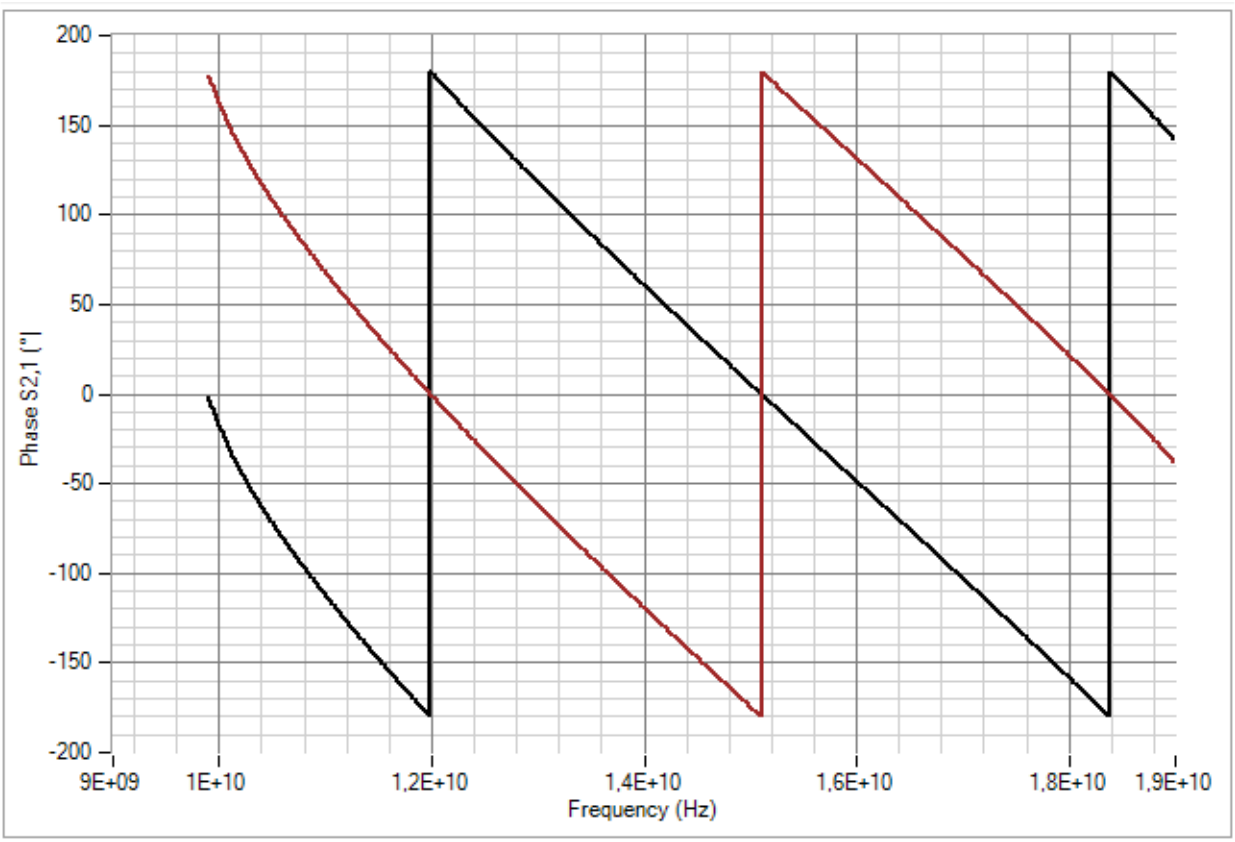
Then I did a second test, using exactly the same UOSM calibration files :

Test 2 :

In term of amplitude the 2 traces was strictly identical (we can see only one trace). But in term of phase we still had the offset .

Black trace = Nick's macro / Brown trace = Mike's macro





Here the unwrapped phase :
Blue trace = Nick's macro / Orange trace = Mike's macro

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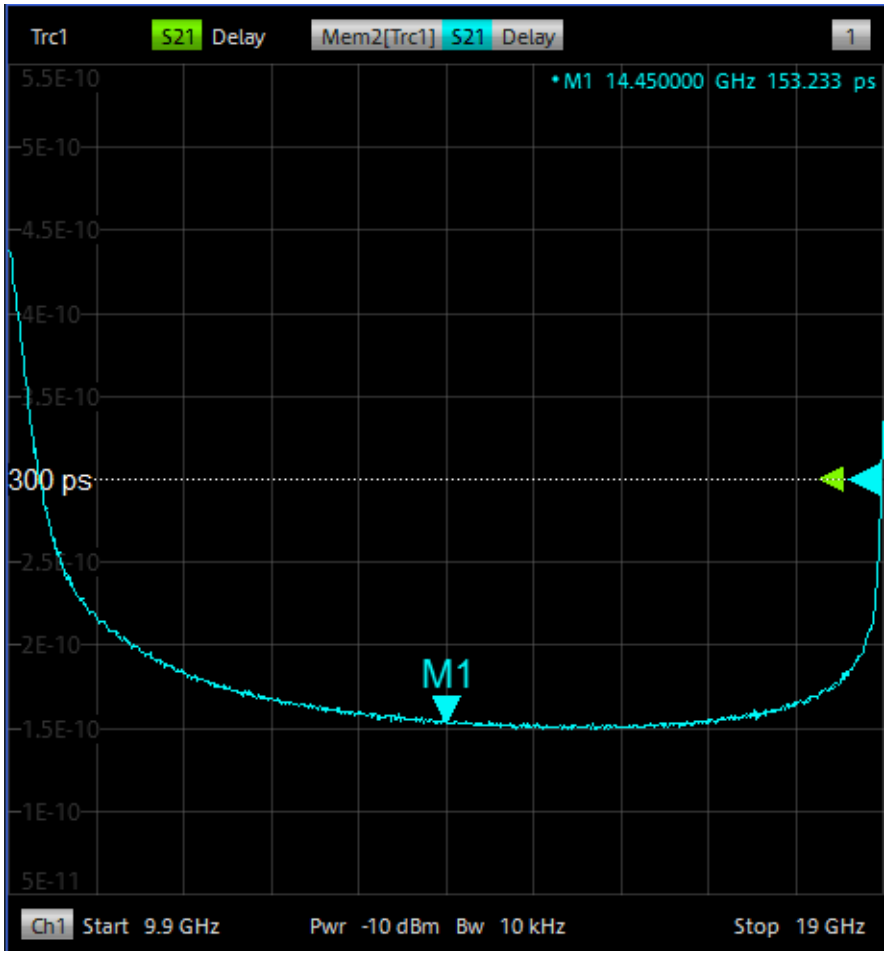
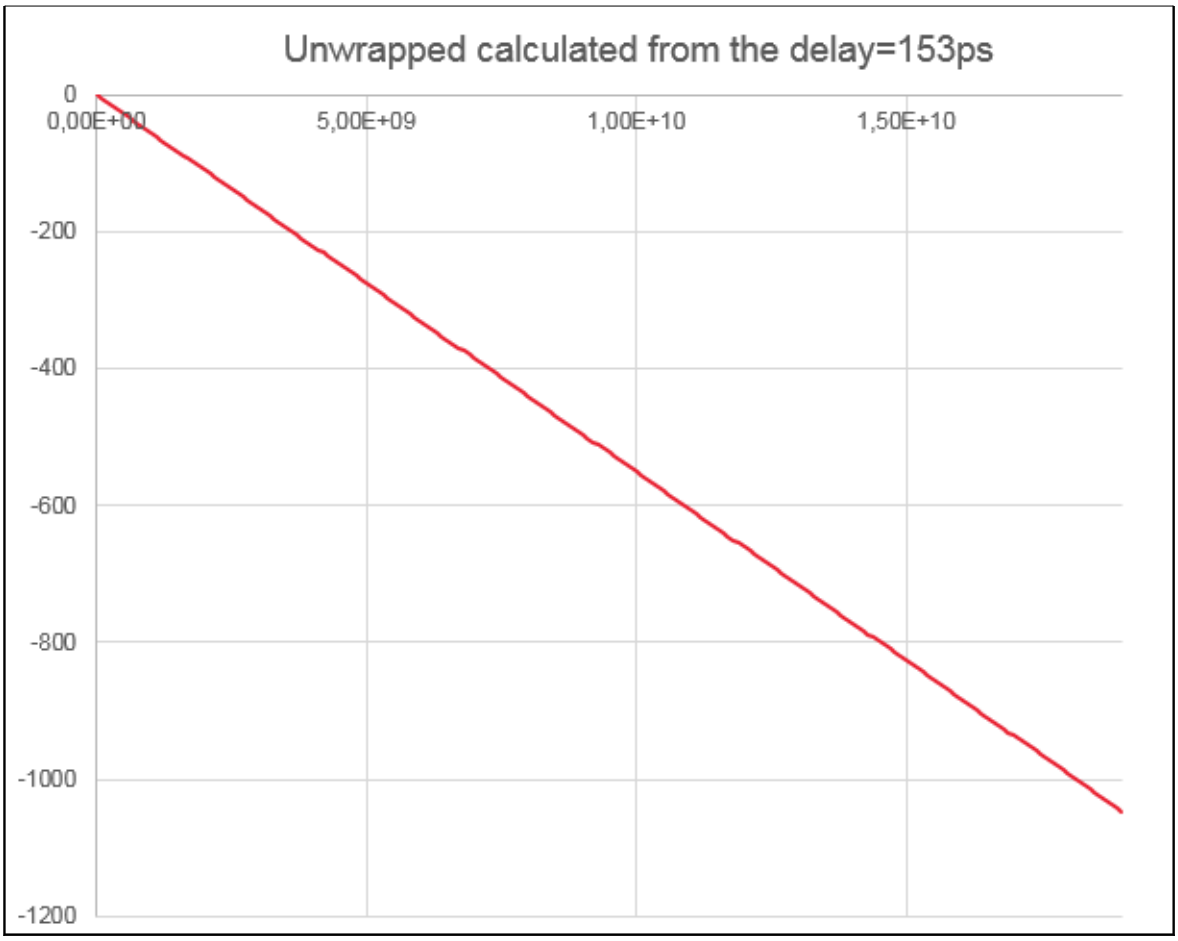
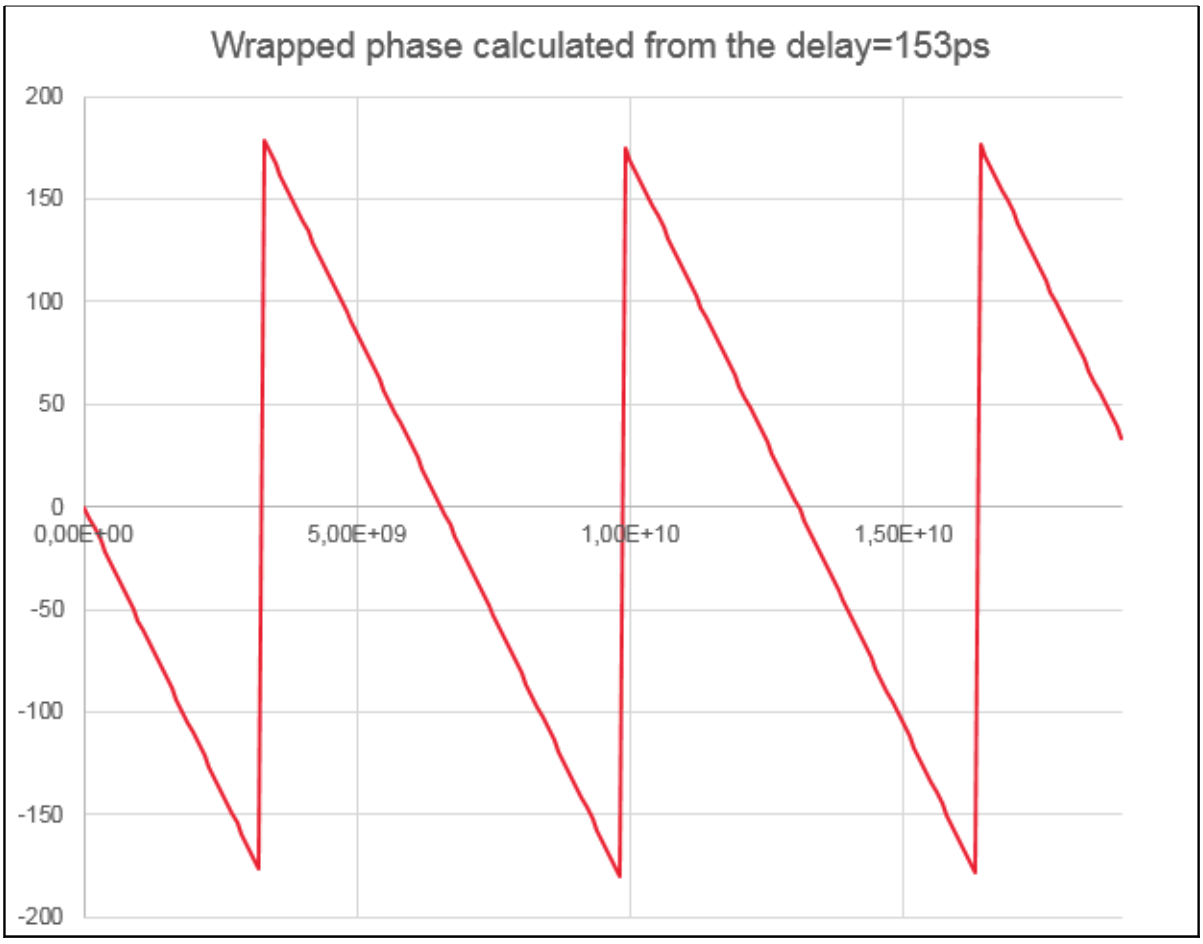
Today , I calculated the theoretical phase from the delay =153ps.

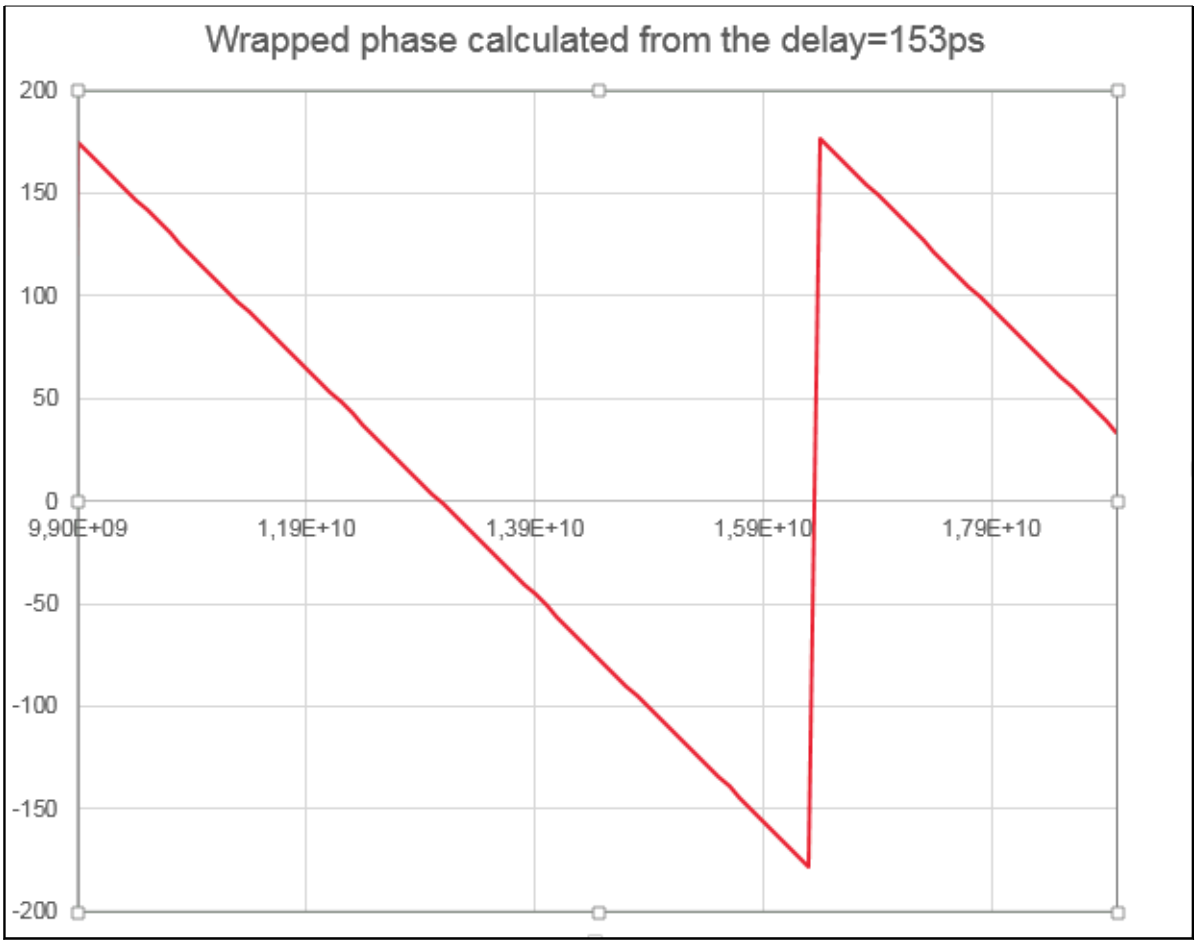


From DC to 19GHz :


Unwrapped calculated from the delay=153ps
0
0,00E+00
5,00E+09
1,00E+10
1,50E+10
-200
-400
-600
-800
-1000
-1200

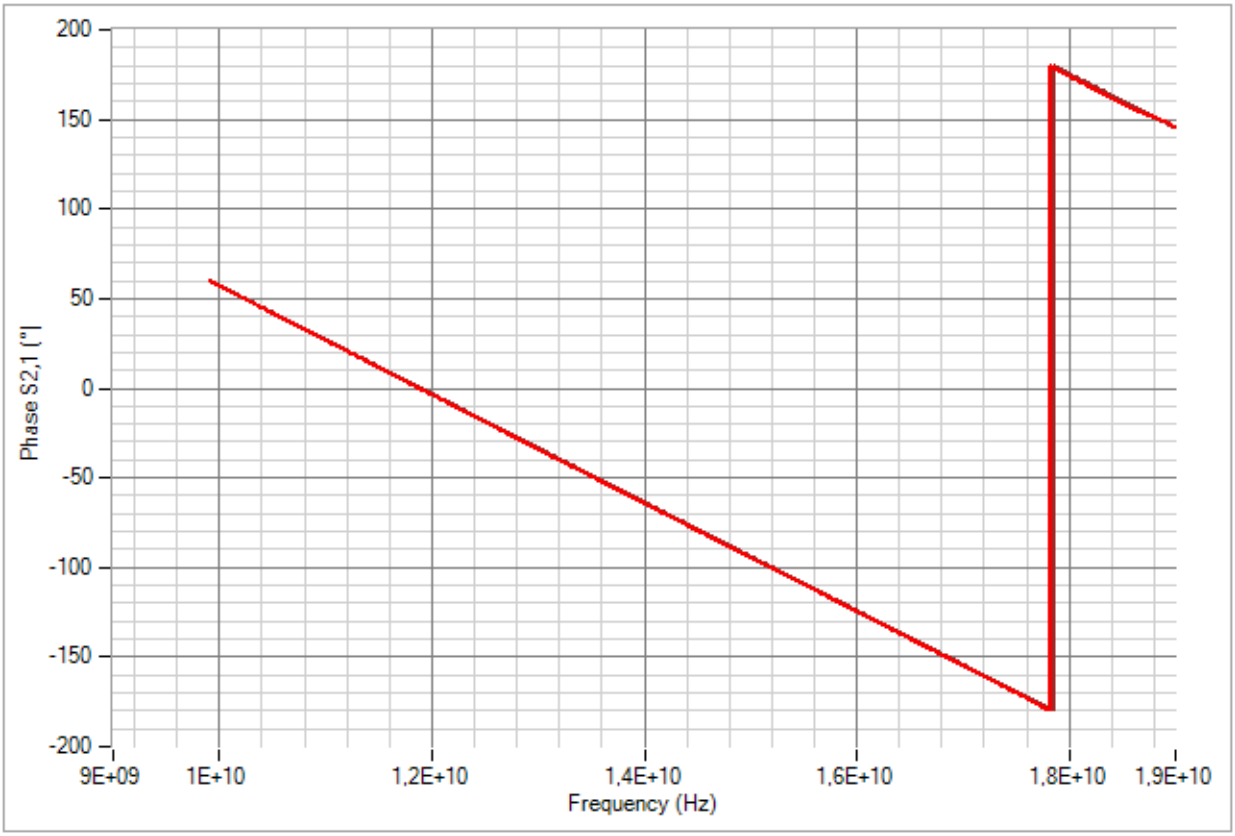


If we zoom to the same frequency range than the extracted s2p files, we can see that the trace is comparable to the result extracted from mike's macro :



Then I followed Mike's recommendation :
- I did UOSM,
- Then I added a male-female adaptor to port 1,
- I did a new UOSM,
- I extracted the s2p file of the male-female adaptor.
- And I remeasured it.

Black trace = Nick's macro=Brown trace = Mike's macro / Red trace = Real measurement
As you can see the results are identical !



My conclusion is :
The 2 macros give the same phase results for an adaptor, which has **linear delay**.
But in the 2 first tests that I did yesterday, I calculated the s2p of **transitions waveguide to coax** which has **non-linear phase** (=non-linear delay at the borders), in this case I have the problem !

Best Regards,
Fred

Mike Leffel | From: Mike Leffel/RSA@RSA To: Frederic Molina... | 07/12/2015 20:10:17

From: Mike Leffel/RSA@RSA
To: Frederic Molina/RSF@RSF@RUS,
Cc: Nick Lalic/RSA@RSA
Date: 07/12/2015 20:10
Subject: Re: S2P extractor app /cr/

Hi Frederic,

I am traveling right now, so I can not check this for a day or two.

However, here is an easy for you to check if my Macro or if Nick's macro gives the right result.
(I remember doing this when we first released the macros. It seems an error has crept back into one of the approaches. So what you did is a very good test to run.)

Do a two port cal. Then add a male - female adaptor from a cal kit to one of the ports, and do a second two port cal. (My routine will work with 1 port, 2 port, 3 port or 4 port calibrations.)

Now extract the s2p file for the adaptor.

Finally calibrate and then measure the adaptor. The extracted results need to match the measured

results.

The equations have an ambiguity of +/- 180 degrees. So the algorithm needs to project and select the correct sign. So this is the most likely cause of the error.

BTW, if you use the exact same 2 port calibration files with Nick's program and with my program, the results should overlay each other exactly. Does this happen?

I am concerned that the amplitudes are not matching perfectly. Is this because you did different calibrations for Nick's macro test vs my macro test?

Regards,

Mike

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Frederic Molina	From: Frederic Molina/RSF@RSF To: Mike L...	2015-12-07 11:01:17 AM
Mike Leffel	Frederic Molina---12/03/2015 01:12:32 AM---Fro...	07/12/2015 12:42:18