TFCompanion update: FFT differential correction improvement. Build: 09092018

1. What is differential FFT.

Differential FFT is a method of indirect measurement of the layer thickness based on results of other layers measurement. In the simplest case of the 2 layer stack we will have 3 peaks: Layer 1, Layer 2 and Layer1+Layer 2 (total thickness). Lets say layer 2 peak is very weak, in this case we can determine it as L2=Total thickness- L1.

2 The problem

Differential FFT was implemented in TFCompanion several years ago. But it was used mostly to measure thin interfaces. Thick interfaces can also be measured but sometimes there is a problem. Software does data analysis in 2 steps: (1) determine all the peaks that match the thickness constraints and assign to layers (2) correct results using differential FFT. There is only one set of thickness constraints that is used on step (1) and (2) – this is a problem. The solution is to add additional constraints that are used only on step 1. These constraints are used only for Differential thickness analysis – in other cases they are ignored.

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2. Example and details

Example: Filmstack ~ 70um PET/ 20 um coating

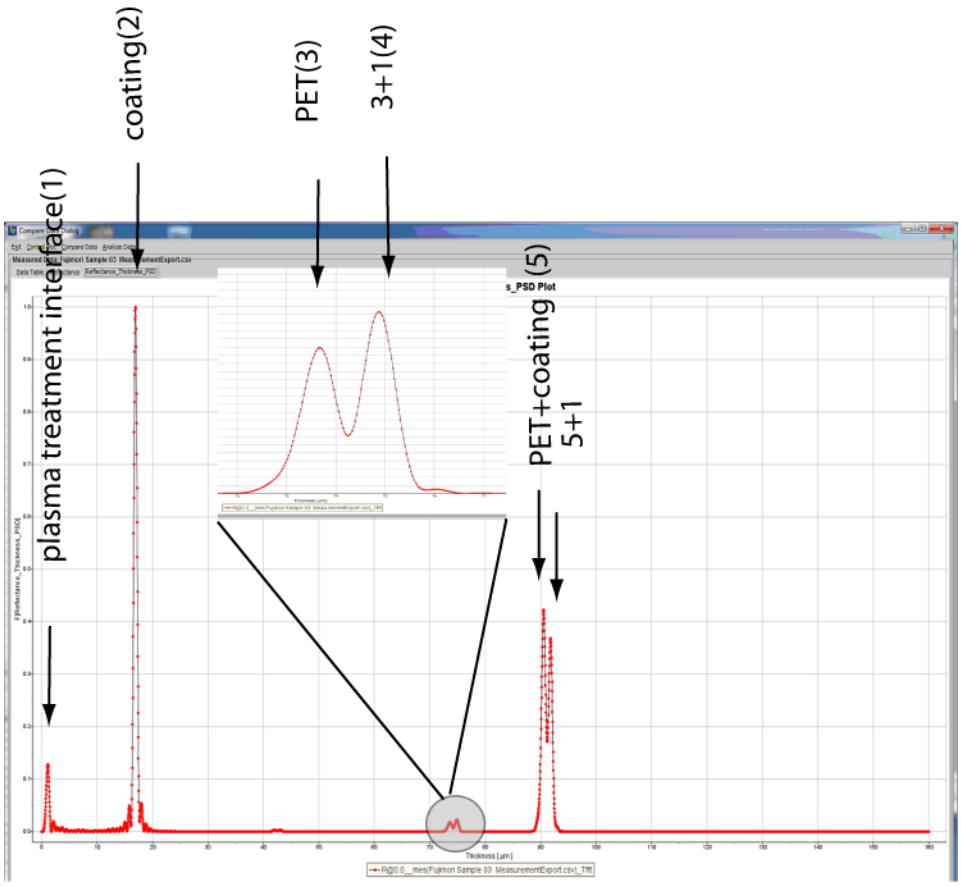


Fig. 1 FFT of the measurement. PET thickness peak (#3) is very weak – it can be measured but maybe difficult in some cases. The solution is to use differential FFT and determine PET thickness = Layer 5- Layer 2. Layer 2 (coating) can be measured directly.

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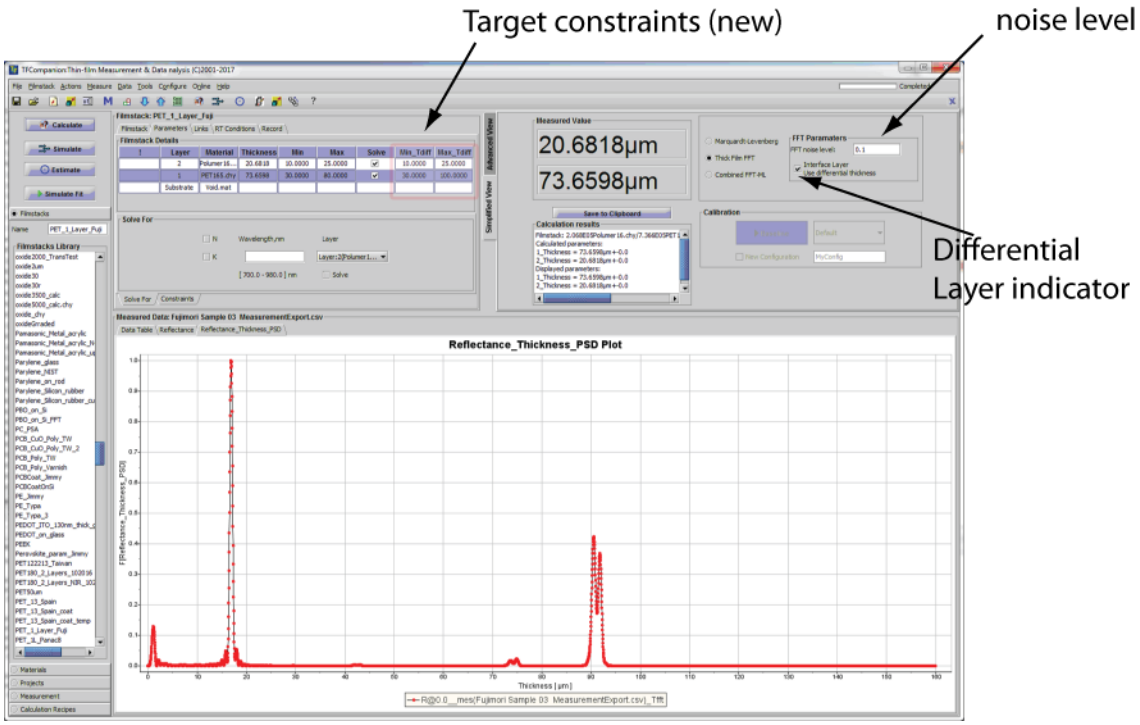


Fig2. Measurement results.

New target constraints for PET layer are [30-100um], final thickness constraints [30-90um]

Coating layer has the same target and final constraints.

Noise level is set to 0.1 (this will exclude the weal PET peaks)

PET thickness (73.65 um) – match the value of the direct weak peak.

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3. Filmstack and measurement recipe.

New Target constraints are saved with the filmstack but FFT conditions (noise level, differential FFT, etc.) are saved in the measurement recipe



Fig. 3 FFT conditions can be attached to the measurement recipe.
When both filmstack and FFT conditions are attached to the measurement recipe – it will have all information to do correct data analysis

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