Response to the reviewer

1. The metal substrate in the model is treated as perfect mirror. In previous measurements, see the reference 1, the conductivity of the compound material was determined to be 2.269+/-0.057 S/m, while the literature value for the conductivity of the aluminium substrate is around 37.7 MS/m. By having a conductivity seven orders of magnitude higher than the layer material, it is reasonable to assume, that it acts as a PEC in comparison. In more recent not yet published measurements, instead of an aluminium substrate, stainless steel and molybdenum had been used as substrates and it could be proven, that the choice of substrate material doesn't impact the absorption, at least for these other metals.
Short sentence added.

2. I agree, the nomenclature is rather confusing. The main difficulty in the situation at hand is, that the real and imaginary part of the wave vector begin to influence each other, as soon as the conductivity of the material can not be assumed to be close to 0.
When starting with the Maxwell equations for linear isotropic mediums $\Delta \mathbf{E} + k_{layer}^2 \mathbf{E} = 0$ the wave vector inside the layer is given in its most general form as $k_{layer}^2 = \epsilon \mu \omega^2 - i\mu\omega\sigma$, with the permittivity consisting of an imaginary and a real contribution. In the case of dielectrics, we could ignore the second term, for metals the first one. For the oxide materials, none.
When the permittivity is now split in the real and imaginary contribution, the resulting formula is $k_{layer}^2 = \epsilon'\mu\omega^2 - i\mu\omega(\omega\epsilon'' + \sigma)$. Both parameters associated with absorption mechanisms, the imaginary part of the permittivity and the conductivity are now in the same term and can't even be distinguished for a single frequency, that's why I called the joint material describing parameter absorption coefficient. This is not to confuse with the attenuation constant, which one gets by calculating the complex root to get the wave vector without the squared. This is calculated to be:

$$\sqrt{k^2} = \pm \left(\sqrt{\frac{\sqrt{\epsilon'^2\mu_0^2\omega^4 + \omega^2\mu_0^2 a^2} + \epsilon'\mu_0\omega^2}{2}} - i\sqrt{\frac{\sqrt{\epsilon'^2\mu_0^2\omega^4 + \omega^2\mu_0^2 a^2} - \epsilon'\mu_0\omega^2}{2}} \right)$$

Just the positive solution makes physically sense. The first square root one could describe as angular wavenumber, because it describes the spatial propagation of the electro-magnetic wave in the medium. The term with the root behind the imaginary number on contrast describes the absorption in the material, which is best described as attenuation constant as you suggested in the question.
That is the short version of it, I hope it is now understandable, why I took such a light handed approach in the conference proceeding. I added another reference to the paper, where it is described in more detail.
I also changed the representation of the unit of the absorption coefficient to S/m instead of the pure SI units, I agree, it's less confusing this way.

3a. Clarification is added.
3b. I'm a bit shying away from giving explicit numbers, simply because they can be very misleading.
When for example taking something as fundamental as the resonant thickness, the concept to calculate is very intuitive and sounds simple: You take the wavenumber times the distance travelled through the layer and this needs to be 90°, that after two passings destructive interference occurs. Sounds fairly simple, when you as example take a refractive index of 2 and a frequency of 170GHz, you get a resonant thickness of 441µm instantly. But then, instead of perpendicular incidence, the incident angle is 45°, suddenly it increases to 493µm, because the length travelled inside the layer increases. And this is without considering the absorption, this can change the wave vector completely, but this depends on both the frequency and the amount of absorption. For the aforementioned 170GHz and an absorption coefficient of 100S/m, this increases the value of the wave vector by around 10%, for 105GHz around 25% could be expected. This now at first increases the phase change per length travelled, but at the same time decreases the length travelled inside the

material, because the angle of the propagation direction inside the medium is also decreased. The complete effect being in the case of 170 GHz, 45° and 100S/m practically none, both effects cancel out almost perfectly, but introducing the same absorption coefficient in another situation can change the resonance thickness by an order of magnitude.

So I could make similar parameter discussions in the proceeding, but I think, this would either be short and give readers a false sense of safety or else would be much to extensive for the format.

4. The wrong term was used, it is clarified now, that the aluminiumoxid and the titaniumoxide stay in separate phases and don't create a mixed phase.

5. Figure order corrected.

6. I rewrote the complete section with your remarks in mind. I hope, it's now much clearer, what I tried to express. I also added a paragraph in the beginning, which gives a summary of the work and results.

7. I added a discussion of the anticipated ideal parameter ranges, but as you can see, these ranges are still quite large. It is one of the next planned steps to find the exact optimal parameters, that's why I wanted to stay careful about the statements made here.

Minor items: The sentences have been changed, hopefully they are clearer now.