Brief Minutes of Channel Modelling Ad Hoc – Task 1 Telecon
23rd June 2004

1. Present (apologies to anybody left out – we tried to capture as many names as possible): Richard Penty (chair), Jonathan Ingham, Ian White, David Cunningham, Albrecht Rommel, Stewart Goudie, Lars Thon, Sudeep Bhoja, Ali Ghiasi, Tom Lindsay, John Abbott, Steve Swanson, Jim Morris, Frank ?, Henry Wong, Petar Pepeljugoski, Stefano Bottacchi, John Ewen, John George, Robert Lingel, Yi Sun, Yu Sun, Petre Popescu, Gary Shaulov, Brent Whitlock, Abhijit Shanbhag, Paul Kolesar

2. Problem definition: David Cunningham stated that it was very important to define the channel model, at least for OM1, as quickly as possible. In particular it was important that the methodology, if not all of the detail, of the chosen model(s) be defined at the Plenary meeting in Portland giving approximately 2.5 weeks. The urgency for OM2,3 modelling was not so great but it would be good if similar timescales were possible.

3. Required output of the model. It was agreed that modal delay times should be provided, along with a clear method for deriving impulse responses from these. Yu Sun from Optium said that they required refractive index profiles. There was some discussion as to whether mode profiles should be provided. It was pointed out that this would mean very large file sizes (Jonathan Ingham said that Cambridge's mode profiles each have over 1500 points). It was also pointed out that if refractive index profiles were made available, then it would be possible to calculate the mode profiles using commercial solvers. It was agreed to look at this aspect in more detail off-line. Finally Lars Thon proposed a common data format to allow easier manipulation of the output data from the model. It was agreed that this would be a good approach for matlab users and Lars agreed to take the lead in this activity.

4. Proposal for adoption of "81 fiber model": Jonathan Ingham proposed that one model that might be suitable for the OM1 case was the so-called "81 fiber model", various outputs from which have already been provided to the task force. Jonathan described the salient features of the model which have been well documented elsewhere. He also answered some of the comments that had been made in advance by John Abbott via e-mail.

There then followed a long and involved discussion about the "81 fibre model" and also the Monte-Carlo model developed for the TIA by (amongst others) Petar Pepeljugoski and John Abbott (afterwards referred to as the TIA model). Various comments were made about the 81 fiber model, a selection being
- Several people said that they didn't think there were enough perturbations in the 81 fiber model
- There were some issues mention by Paul Kolesar (?) regarding anomalous modal results
- Not clear whether all fibres should be scaled to have 500MHz.km bandwidth rather than scaling to 2ns/km DMD and then rejecting any fibres that don't have 500MHz.km bandwidth.
- Ian White requested concrete evidence as to why people were saying that the model was representative of the worst case 5% of installed base

Several people suggested that it should be possible to adapt the TIA model – which currently has been developed for OM3, to do both OM2 and OM1. Comments made on this approach included

- Not clear if perturbation statistics for TIA model were available for OM1.
- Would result in a large data set compared to the reduced data set of the 81 fiber model. This was felt to be an issue by some users – particularly those who wanted the index profiles (e.g. Optium and DOC).

The result of this discussion was inconclusive. David Cunningham asked if it would be possible for perturbations and perturbation PDFs to be made available so that TIA type modelling could be carried out for OM1. It was stated that various fiber manufacturers might be able to make current manufacturing statistics available (e.g. DMD, index profiles) to help this process. OFS said that it should be able to bring some initial details to Task 1 within a one week timescale.

Richard Penty summarised the potential outcomes for OM1 modelling as being
1. adoption of the 81 fiber model or some close variant
2. adoption of the TIA monte carlo model adapted to OM1
3. adoption of a hybrid solution where there were more than the four perturbations in the 81 fiber model but fewer fibers than with the TIA approach.

It was agreed that this conversation would be continued in a separate telecon between the modellers and further agreed that other members of task 1 would be able to join this if they desired. Richard Penty agreed to arrange this telecon, preferably before the Ad Hoc plenary on the 30th. He agreed to request participant availability details by e-mail (sent 23rd June).

5. Perturbations (size and statistics): This was predominantly covered in item 4 above. John Abbott's strawman on perturbations for the 81 fiber model was noted as a very useful contribution to the debate. David Cunningham asked John Abbott to go through his presentation on DMD distributions which John duly did.

6. Mode coupling at connectors: It was noted that Petar Pepeljugoski's approach was probably a very good one. There was some questioning from from Yu Sun about whether this took angular variations into account Petar tried to demonstrate that it did but with time running out, it was agreed to complete the discussion off-line.

7. Next steps and timescale: It was agreed that the immediate action was to hold the modelling telecon as soon as possible to attempt to resolve the modelling approach. This should, if possible, be carried out before the 30th June ad hoc plenary telecon.

Richard Penty