

# Multimode Fiber Channel Modelling

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## ***Summary of work since Vancouver meeting***

- **Sample frequency and impulse responses of “worst-case” 62MMF profiles have been made available to SG by email (from [ihw3@cam.ac.uk](mailto:ihw3@cam.ac.uk)). To date 9 companies have been sent the files**
- **A second set of tables (of relative mode delays and coupling coefficients) are now available so that members can calculate “worst case” fiber responses for arbitrary launch conditions**
- **It is proposed that these are placed on the IEEE web site, but they can be currently obtained directly from Ian White, [ihw3@cam.ac.uk](mailto:ihw3@cam.ac.uk)**

# Construction of an impulse response (IPR) using tables of relative modal delay times and power coupling.

LP mode-group order	Relative delay, ns	Relative optical power
3	0.0000	0.00
4	0.0099	0.00
5	0.0204	0.00
6	0.0318	0.00
7	0.0446	0.00
8	0.0588	0.00
9	0.0744	0.00
10	0.0887	0.01
11	0.0993	0.02
12	0.1077	0.04
13	0.1149	0.07
14	0.1276	0.10
15	0.1483	0.14
16	0.1869	0.16
17	0.2726	0.16
18	0.4048	0.13
19	0.6408	0.09
20	0.8971	0.05
21	1.2199	0.02
22	1.3205	0.01
23	0.9981	0.00

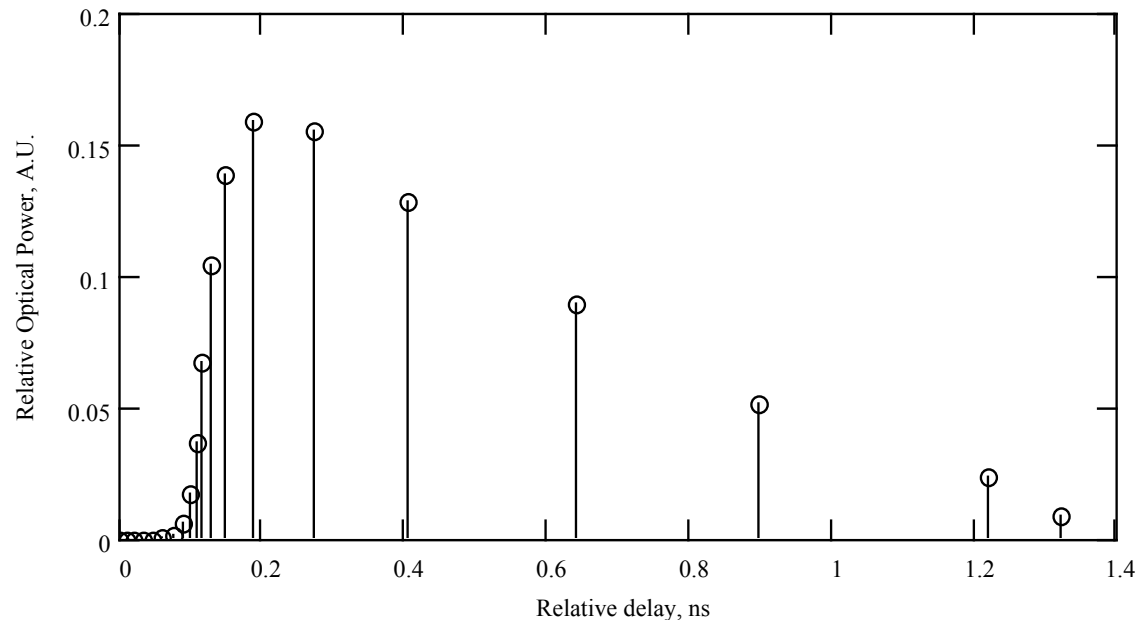
Impulse responses are constructed by creating tables of relative delay time and relative optical power for:

- a given fiber and,
- a given offset.

This example is for fibre number 53 and offset 24  $\mu\text{m}$ .

# Illustrative plot of the example impulse response.

Graphical representation of an IPR: fiber number 53, offset 24 $\mu$ m.



## In the tables provided:

- The delay times are exact, they are calculated using a mode solver.
- The relative powers are approximate, they are calculated using ideal modes of the fibre.
- However, this compromise is appropriate as it greatly reduces the number of tables and simplifies the construction of IPR's.