EPIPPROP

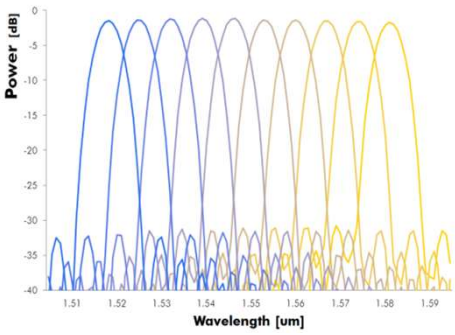
Bespoke simulation tool for WDM/DWDM devices

AWGs and Echelle Gratings Designed Automatically

Diagram of 'Top Hat' AWG and Star Coupler

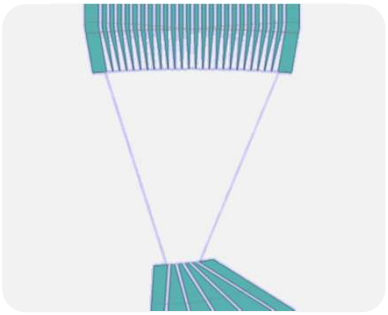
Quick Start with Templates

4 AWG and 3 Echelle grating templates allow designers to see results on day one.



Rigorous Full Vector 3D Simulations

Market leading models developed specifically for AWGs and Echelles, bringing unrivalled speed and accuracy.



Automated Design and Layout

Choose wavelength spacing of channels and EPIPPROP will calculate the route of your waveguides.

Utilise Photon Design's proven track record of high performance electromagnetic simulations to design and simulate wavelength division multiplexing devices for your circuit including arrayed waveguides AWG and Echelle gratings. EPIPPROP provides a low barrier to entry for testing WDM devices while providing a great deal customisation for experienced designers.

Have your design fabrication ready with GDS-II export and tolerances investigated such as slab thickness variations and corner rounding in Echelle gratings.

Start your 30 day trial today

Photon Design have been serving the photonics community for over **30 Years** with market leading software for designing passive components, active components, and entire PICs. All of our tools are under continuous development driven by the feedback of our users and their cutting edge research.

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Tapers and Cross-Coupling Input/ Output Arrays

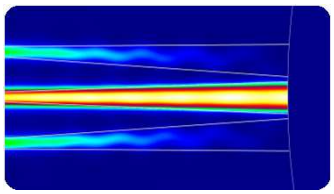
Using FIMMPROP – Waveguide Simulations with EigenMode Expansion

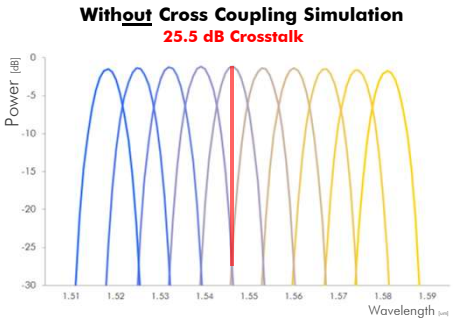
Its common for tapers to precede and follow the star coupler of a WDM device to improve coupling but the cross-talk between neighbouring waveguides can have a *significant effect on performance*.

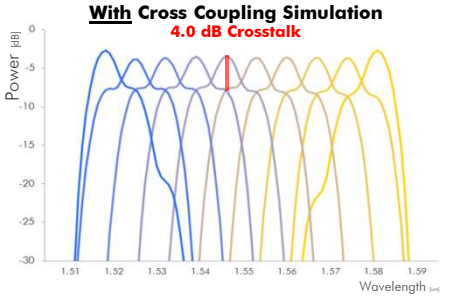
To simulate this, EPIPPROP will call Photon Design tool FIMMPROP to use it's rigorous EigenMode Expansion method, modelling how adiabatic the tapers are and how they couple to neighbouring waveguides.

EPIPPROP will pilot FIMMPROP so you don't need to master a new tool.

EPIPPROP will automatically re-build the geometry of your tapers, run a sweep of simulations across multiple wavelengths, and return the results to EPIPPROP automatically.





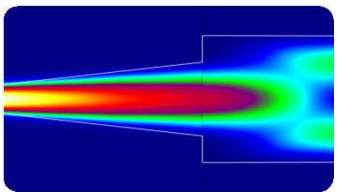


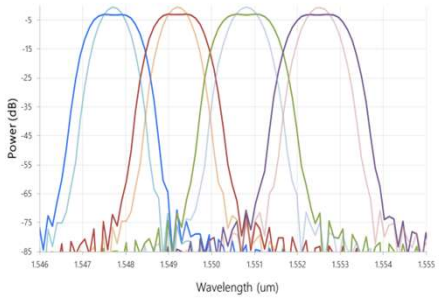
Wide Channel Designs

Using FIMMPROP – Waveguide Simulations with EigenMode Expansion

Channel broadening increases the wavelength tolerance of WDM devices, accommodating for multiple sources of error such as temperature variations, doping, and imperfections in the slab (which can be simulated in EPIPPROP).

Using an MMI as an input broadens the channels without introducing multi-modal behaviour at the input and output waveguides. MMIs at the input of an EPIPPROP device are co-simulated rigorously using Photon Design's tool FIMMPROP and its EigenMode Expansion method.





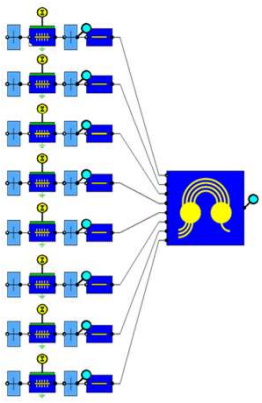
Full Colour – Broader bands using MMIs
Faced Colour – No MMI used

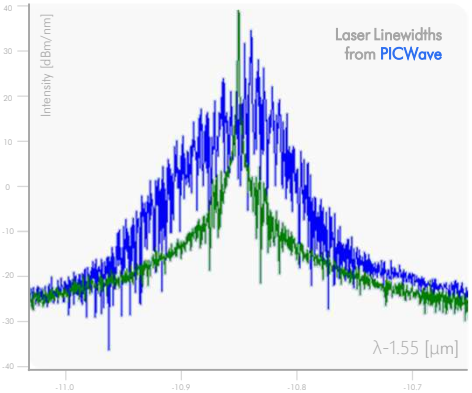
Export for Full Circuit Simulation

Using PICWave – Time Domain Circuit Simulator Including Active Components

Simulate EPIPPROP devices in the full context of their circuit by exporting results to PICWave and address unforeseen effects.

This circuit (right) contains an array of high reflectivity DFB lasers connected to an AWG simulated in EPIPPROP including the reflectivity at each set of facets. By simulating the lasers and AWG together the negative effect the back reflections becomes apparent, drastically expanding the line width of the lasers.



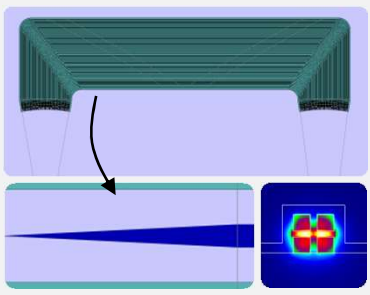


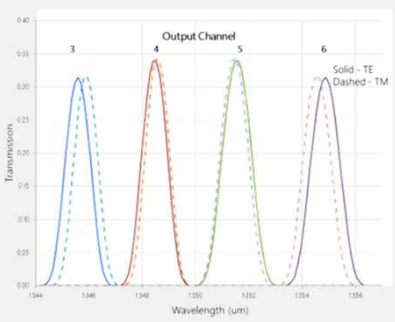
With Facet Reflections [Linewidth = 2.58 MHz]
Without Facet Reflections [Linewidth = 4160 MHz]

Advanced Customisation

EPIPPROP's AWG arms have many degrees of customisation to create near arbitrary designs. This includes introducing tapers and slot waveguide used in *polarisation insensitive designs*.

In the example (right) an introduced slot waveguide allows for TM like modes to catch up with the TE like modes propagating through the AWG meaning the device will function equally for both polarisations.





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