

The BELLHOP underwater acoustics ray tracing tool 2025-08-25

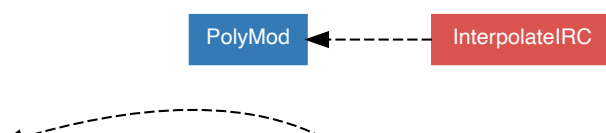
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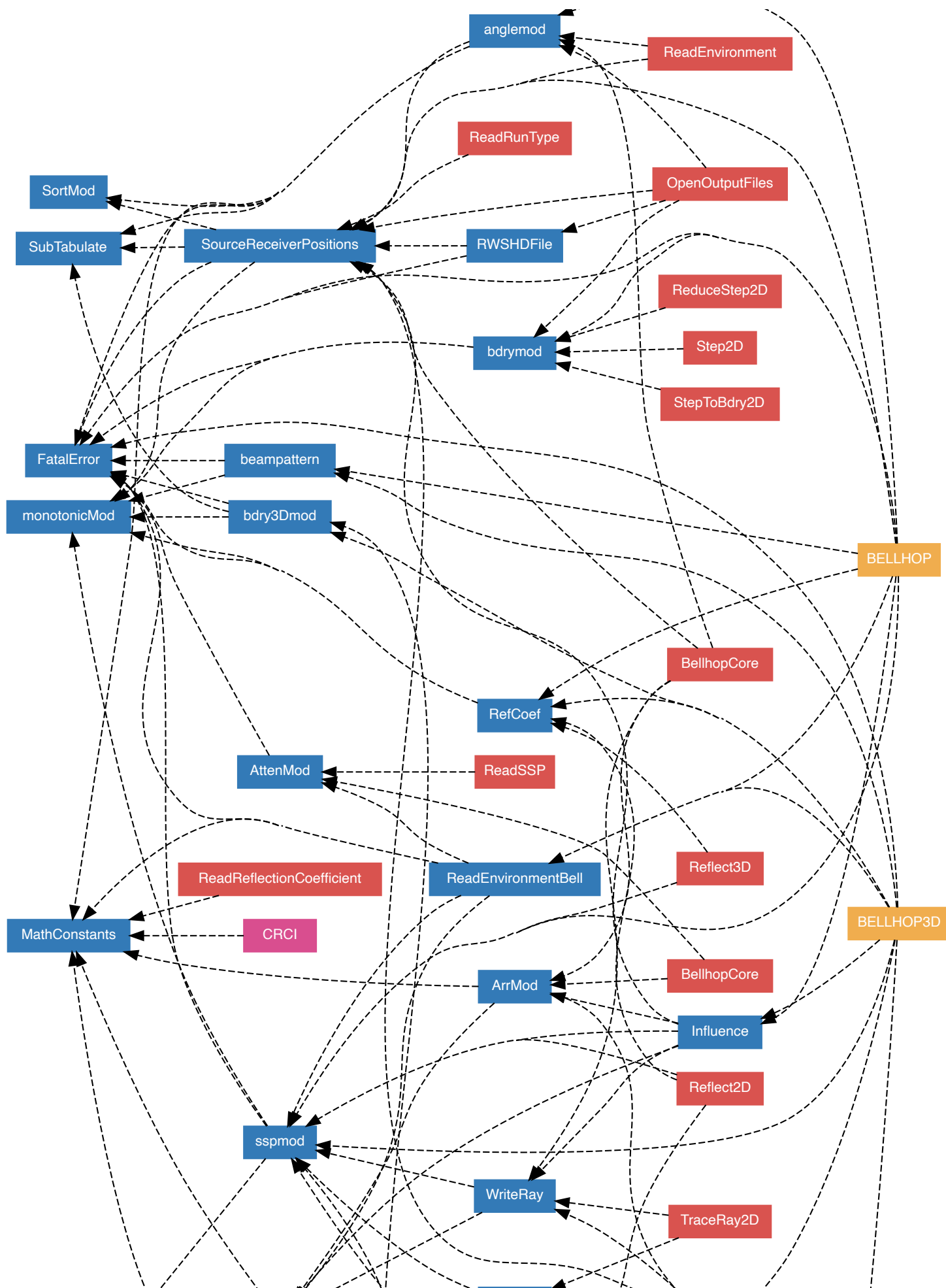
Modules

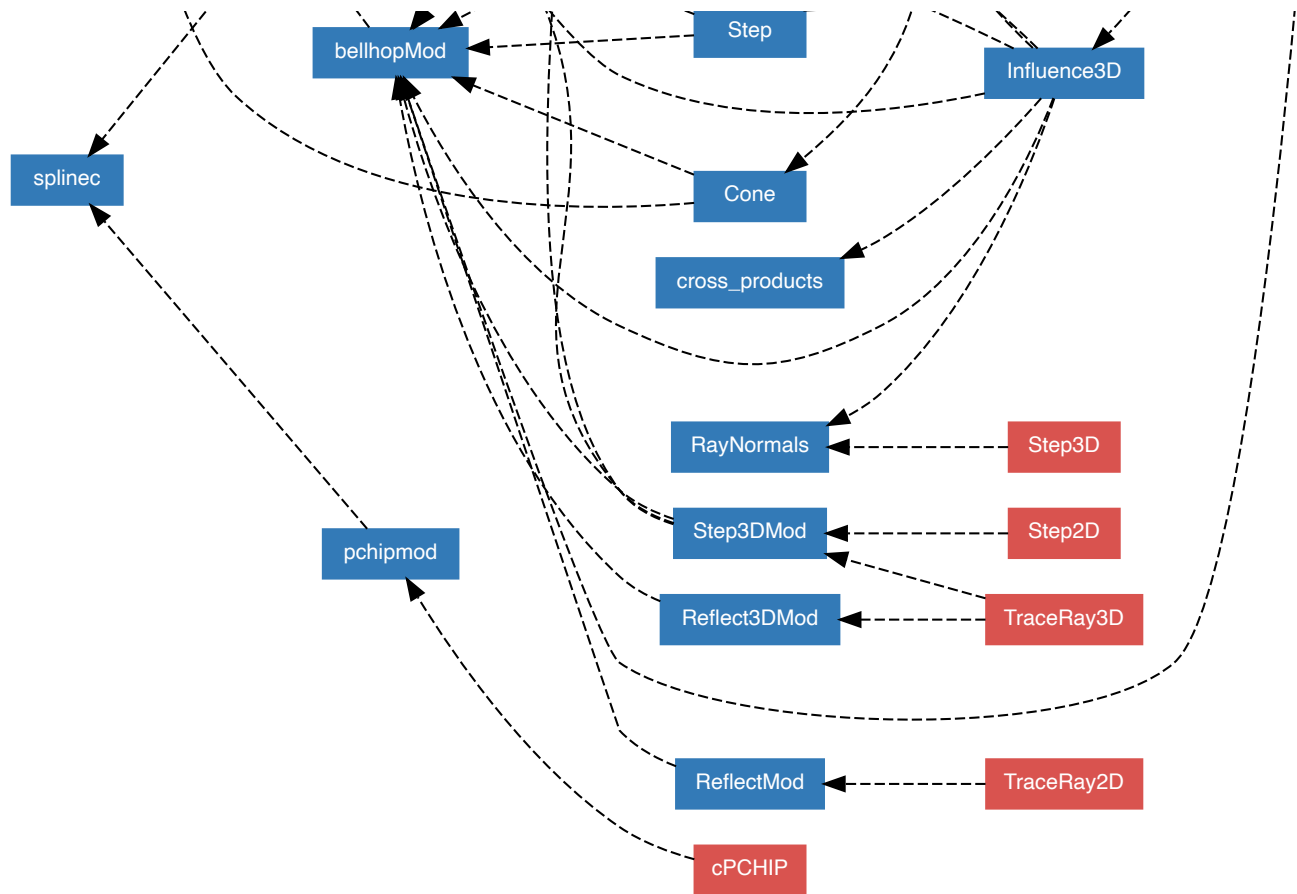
Module	Source File	Description
anglemod	angleMod.f90	Provides angle calculations and coordinate transformations
ArrMod	ArrMod.f90	Management of acoustic arrival data including storage, sorting, and output formatting
AttenMod	AttenMod.f90	Acoustic attenuation calculations including volume attenuation formulas and unit conversions Read more...
bdry3Dmod	bdry3DMod.f90	3D boundary handling for complex altimetry and bathymetry with spatial interpolation
bdrymod	bdryMod.f90	Boundary handling for altimetry (top) and bathymetry (bottom) with interpolation capabilities
beampattern	beampattern.f90	Source beam pattern handling including loading, interpolation, and angular weighting
bellhopMod	bellhopMod.f90	Main BELLHOP module containing global variables, data structures, and types for acoustic ray tracing
Cone	Cone.f90	Provides cone formulas for 3D beam computations
cross_products	cross_products.f90	Provides a 3D cross product function for both single and double reals
FatalError	FatalError.f90	Provides ERROROUT error message
Influence	influence.f90	Computes beam contributions to complex pressure fields using various beam weighting approaches
Influence3D	influence3D.f90	3D beam influence calculations with complex pressure field contributions and spatial weighting
MathConstants	MathConstants.f90	Provides maths constants such as pi and i
monotonicMod	monotonicMod.f90	Provides interface to test whether an input vector is strictly monotonically increasing
pchipmod	pchipMod.f90	Subroutines and functions related to the calculation of the Piecewise

Cubic Hermite Interpolating Polynomial (PCHIP)

PolyMod	PolyMod.f90	Polynomial approximation and evaluation routines for numerical analysis
RayNormals	RayNormals.f90	Provides ray normal vector calculations
ReadEnvironmentBell	ReadEnvironmentBell.f90	Provides environment file reading and initialization
RefCoef	RefCoef.f90	Provides reflection coefficient data
Reflect3DMod	Reflect3DMod.f90	3D ray reflection computations at boundaries with complex geometry and loss calculations
ReflectMod	ReflectMod.f90	Ray reflection computations at acoustic boundaries with loss and phase calculations Read more...
RWSHDFile	RWSHDFile.f90	Shade file I/O operations including binary format handling for acoustic field data
SortMod	SortMod.f90	Provides an interface for performing an insertion sort on a vector
SourceReceiverPositions	SourceReceiverPositions.f90	Reads in source depths, receiver depths, receiver ranges, and receiver bearings
splinec	splinec.f90	Cubic spline interpolation functions and procedures
sspmod	sspMod.f90	Sound speed profile handling with interpolation, derivatives, and environment management
Step	Step.f90	Ray propagation with adaptive step size control and boundary interaction handling
Step3DMod	Step3DMod.f90	3D ray propagation with adaptive step control and complex boundary interactions
SubTabulate	subtabulate.f90	Provides "subtabulation" functions (single and double) for creating interpolated ranges
WriteRay	WriteRay.f90	Ray data compression, formatting, and output to ray files with selective point retention





[Help](#)

The BELLHOP underwater acoustics ray tracing tool was developed by Michael B. Porter / UC San Diego / Adelaide University

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