

Observation of Gouy Phase Shift in a Mach-Zehnder Interferometer

Abstract



Convergent beams travelling through their focus from minus infinity to plus infinity not only experience the accumulation of the phase corresponding to the traversed optical path length, but also accrue a constant π phase term, known as the Gouy phase shift, discovered by the scientist of the same name at the end of the nineteenth century. When such a beam interferes with a collimated one, the Gouy phase shift is revealed when the interference patterns generated on both sides of the focus are compared: the ring patterns are negatives of each other. This can be observed in a Mach-Zehnder.

Modeling Task



Interference Pattern



Peek into VirtualLab Fusion



Workflow in VirtualLab Fusion

- Set up input field
 - Basic Source Models [Tutorial Video]
- Construct real components using surfaces
- Define position and orientation of components
 <u>LPD II: Position and Orientation [Tutorial Video]</u>
- · Set channels properly for non-sequential tracing
 - Channel Setting for Non-Sequential Tracing [Use Case]

Definition Type		Relative De	efinition	
Seminor Type		neiduve De	Similari V	
Measurement from		Beam splitte	er (ideal) #1; CS of Channel '1'	
to		Input Chan	inel Coordinate System 🗸 🤟 🧴	
Translation Param	neters Orie	ntation Param	ieters	
Center Point of	Rotations			
Reference Poir Used as Cente	nt to be r Point	Reference	Point of Input Channel V	
Orientation Ang Orientation [lles Definition Ty	/pe Cartesi	an Angles 🗸 (:::)	
1 - Z-	Axis Directio	on Definition		
	Ang	le / Axis	Value	
	Alpha	~	-45°	
Swap Order ≎	Beta	~	0°	
R	otation Abou	ıt Z-Axis		
~	Z-Axis R	otation Angle	0°	

VirtualLab Fusion Technologies





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