

आचार्य प्रो. विद्यागोपाल झा

Indian Institute of Technology Patna

Advertisement No. 1

Post Applied

DEPARTMENT	POSITION	SPECIALIZATION
Mathematics	Professor	Math



Applicant's Details

Candidate's Name: HEY MAN

Father's / Husband's Name: Father Name

Mother's Name: mother

Date of Birth: 2

Gender: Male

Category: General

Marital Status: Married

Citizen of India: By birth

PWD: Yes

Permanent Address: F4, Rajparis Padmam Apartments, 188B Sundarraj Nagar, Thathaneri Main Road,

Thathaneri

Address for Correspondence: F4, Rajparis Padmam Apartments, 188B Sundarraj Nagar, Thathaneri Main Road,

Thathaneri

PIN Code: 688688

Mobile No: 09943561865

Email: dhushyanth5602@gmail.com

Academic Qualifications

SCHOOL/INS TITUTE	DATE OF ENTRY	DATE OF LEAVING	BOARD/UNIV.	EXAM/DEGREE	DIVISION	SUBJECTS	PERCENTA GE/CPI	YEAR OF PASSING
sdfsdf	Jun 4, 2024	Jun 6, 2024	sdfsdfs	10th	fsdfsdfs	fsdfsdf	66	2001
sdfsdfs	Jun 4, 2024	Jun 6, 2024	sdfsdfs	12th	sdfsdf	sdfsdfs	65	2003
sdfsdfs	Jun 4, 2024	Jun 6, 2024	sdfsdfs	Masters	dfsdfs	dfsdfs	65	2023
sdfsdfs	Jun 4, 2024	Jun 6, 2024	sdfsdfs	Bachelors	dfsdfs	fsdfsdfs	66	2002

Work Experience

ORGANISATION/IN STITUTE	POSITION	NATURE OF DUTIES	DATE OF JOINING	DATE OF LEAVING	SCALE OF PAY	REMARKS
dcscdcsc	sdcsdcsd	csdcscscs	Jun 7, 2024	Jun 5, 2024	szdcscsc	csdcscsc

References

NAME	DESIGNATION	ADDRESS	EMAIL
Dhushyanth Sundararajan	sdfsdf	F4, Rajparis Padmam Apartments, 188B Sundarraj Nagar, Thathaneri Main Road, Thathaneri	dhushyanth5602@gmail.com
Dhushyanth Sundararajan	sdfsdf	F4, Rajparis Padmam Apartments, 188B Sundarraj Nagar, Thathaneri Main Road, Thathaneri	dhushyanth5602@gmail.com
Dhushyanth Sundararajan	sdfsdf	F4, Rajparis Padmam Apartments, 188B Sundarraj Nagar, Thathaneri Main Road, Thathaneri	dhushyanth5602@gmail.com

PhD Thesis Details

Title of your Ph. D. Thesis	xdffsdfs
Name of your Ph.D. Supervisor	fsdfsdfsdf
Name of your Co-Supervisor	
Date of thesis submission	
Date of viva-voce	

Thesis Guided

COMPLETED	ONGOING
3	3

Patent Details

NUMBER OF PATENTS
3

Citation Details

4

Research Publications

YEAR, VOL. NO. PAGE	AUTHORS	TITLE OF THE RESEARCH PAPER	JOURNAL/CONFERENCE	H- INDEX AND/OR CORE RANK	IMPACT FACTOR
dfsdfsdf	sdfsdfs	sdfsdf	sdfsdfs	sdfsdfs	sdfsdf

Specialization: sdfsdfs

Did you previously apply for any post in this Institute? / Advertisement Number : dfgdfgdfgdfg

If the appointment is offered, how much time would you need before joining the post? : 1kjhnkjkhkj

If you are employed, please state your present basic pay and scale of pay: Tamil Nadu

Teaching Experience

NO. OF DIFFERENT COURSES TAUGHT	NO. OF YEARS
2	2

Book Published

5

Recognition

CATEGORY	DETAILS
Fellow of professional body	sdfsdfazsd
Member of professional body	fasdfasdf
Editorial board memberships	sdfasdf
Seminars/conferences organized	asdfasdfasdf

Legal History

Do you have any legal proceeding ongoing	
Have you at any time been charged acquitted or convicted by a court of law in India or outside India	

List of Uploads

Proof of Date of Birth

Photograph

Research & Development / Industrial/Training experience

Patent Lists

Journal Publications

Conference Publications

Lab Experiences

Description of PhD Works

Research Plan/ Teaching Plan/Vision and Mission for IIT Patna

fghfghfgh

Awards and Honors


Hi

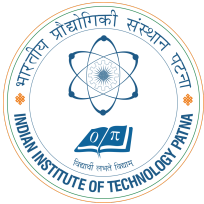
nice one

bye

thanks

Applicant's Signature:

 Applicant Signature



भारतीय प्रौद्योगिकी संस्थान पटना

Indian Institute of Technology Patna

Advertisement No. 1

Declaration

I hereby declare that I have carefully read and understood the instructions attached to the advertisement as available on Patna website and that all the entries in this form are true to the best of my knowledge and belief. I also declare that I have not concealed any material information which may debar my candidature for the post applied for. In the event of suppression or distortion of any fact like category or educational qualification etc. made in my application form, I understand that I will be denied any employment in the Institute and if already employed on any of the post in the Institute, my services will be summarily terminated forthwith without notice or compensation.

 Applicant Signature

(Signature of the Applicant with Date)

Place:

Signature:

Dated:

(Head of the Institution/Organization)

Telephone:

Designation:

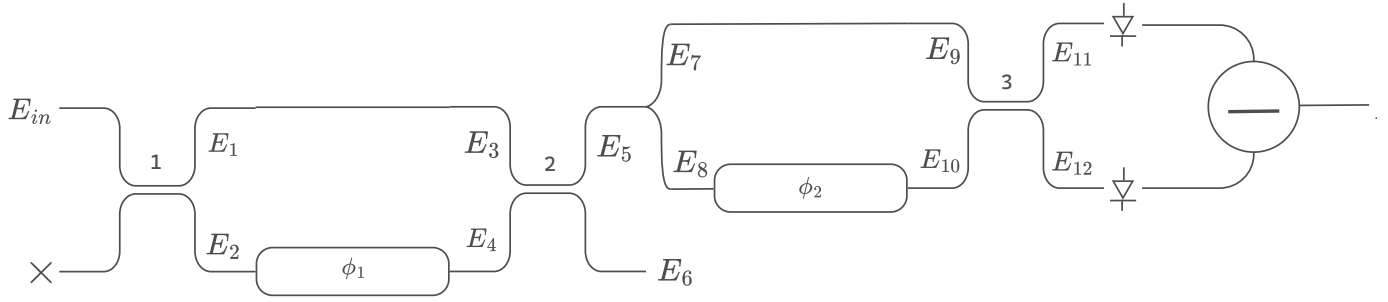
Fax:

Address:

Email:

Remarks:

Diagram



Modulating For Input

For initial directional coupler, input fields are E_{in} and 0.

The transfer matrix of directional coupler is given as follows

$$TM = \begin{bmatrix} \sqrt{1-\alpha} & j\sqrt{\alpha} \\ j\sqrt{\alpha} & \sqrt{1-\alpha} \end{bmatrix} \quad (1)$$

Directional Coupler (1)

Using the transfer matrix matrix defined above, we get

$$\begin{bmatrix} E_1 \\ E_2 \end{bmatrix} = \begin{bmatrix} \sqrt{1-\alpha} & j\sqrt{\alpha} \\ j\sqrt{\alpha} & \sqrt{1-\alpha} \end{bmatrix} \begin{bmatrix} E_{in} \\ 0 \end{bmatrix} \quad (2)$$

Assuming the directional coupler are 50% coupled, we replace $\alpha = \frac{1}{2}$

$$\begin{bmatrix} E_1 \\ E_2 \end{bmatrix} = \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & j \\ j & 1 \end{bmatrix} \begin{bmatrix} E_{in} \\ 0 \end{bmatrix} \quad (3)$$

This gives us

$$E_1 = \frac{E_{in}}{\sqrt{2}} \quad (4)$$

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First Modulator

After the first modulator ϕ_1 , the field is as follows

$$E_3 = E_1 = \frac{E_{in}}{\sqrt{2}} \quad (6)$$

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Using the values of E_3 and E_4 from equations (6) and (7) ,

$$\begin{aligned}\begin{bmatrix} E_5 \\ E_6 \end{bmatrix} &= \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & j \\ j & 1 \end{bmatrix} \begin{bmatrix} E_3 \\ E_4 \end{bmatrix} \\ &= \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & j \\ 1 & j \end{bmatrix} \begin{bmatrix} \frac{E_{in}}{\sqrt{2}} \\ \frac{j}{\sqrt{2}} E_{in} e^{j\phi_1} \end{bmatrix} \\ &= \frac{E_{in}}{2} \begin{bmatrix} 1 & j \\ 1 & j \end{bmatrix} \begin{bmatrix} 1 \\ j e^{j\phi_1} \end{bmatrix} \\ &= \frac{E_{in}}{2} \begin{bmatrix} 1 - e^{j\phi_1} \\ j(1 + e^{j\phi_1}) \end{bmatrix}\end{aligned}$$

Therefore, we get

$$E_5 = \frac{E_{in}}{2} (1 - e^{j\phi_1}) \quad (8)$$

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We can ignore E_6 since it is not being used as input.

Therefore, the electric field which represents the inputs of MAC operation can be represented as

$$E_{input} = \frac{E_{in}}{2} (1 - e^{j\phi_1}) \quad (10)$$

MultiMode Interferometer (MMI)

The field is split into two fields having equal power.

Thus,

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Modulating for Weight Setting

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Applying $\alpha = \frac{1}{2}$ in eqn (14),

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Intensity Reading

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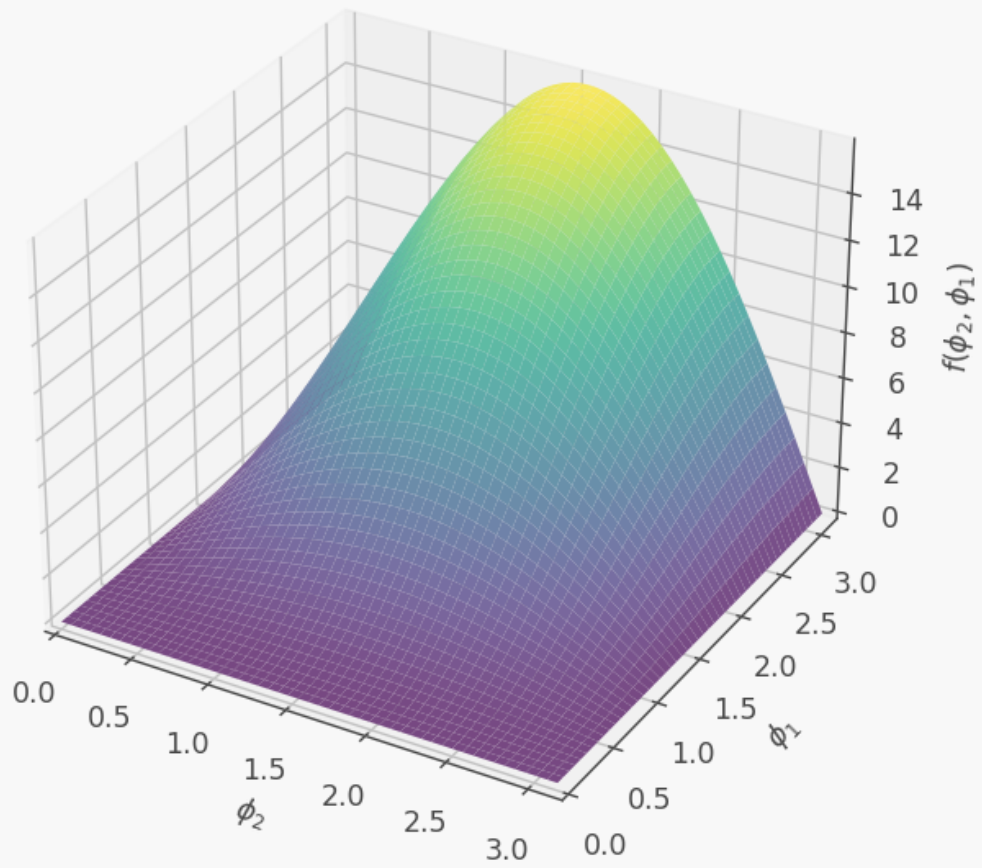
and

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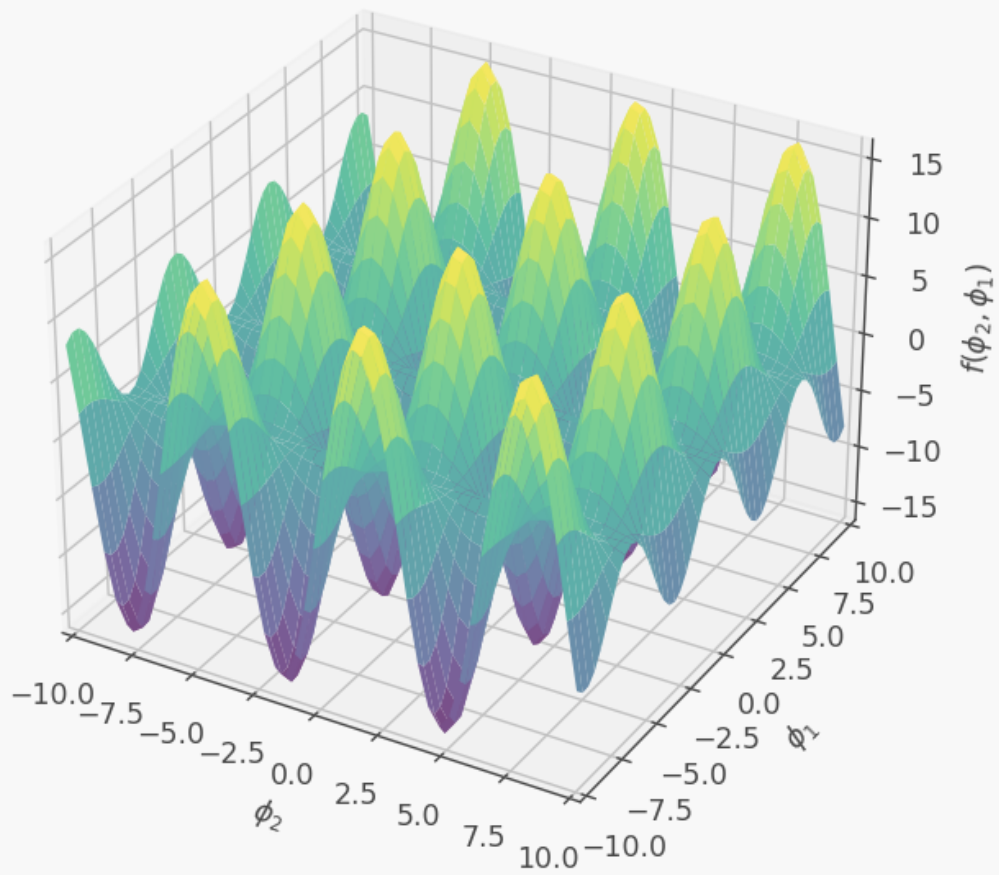
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Plots

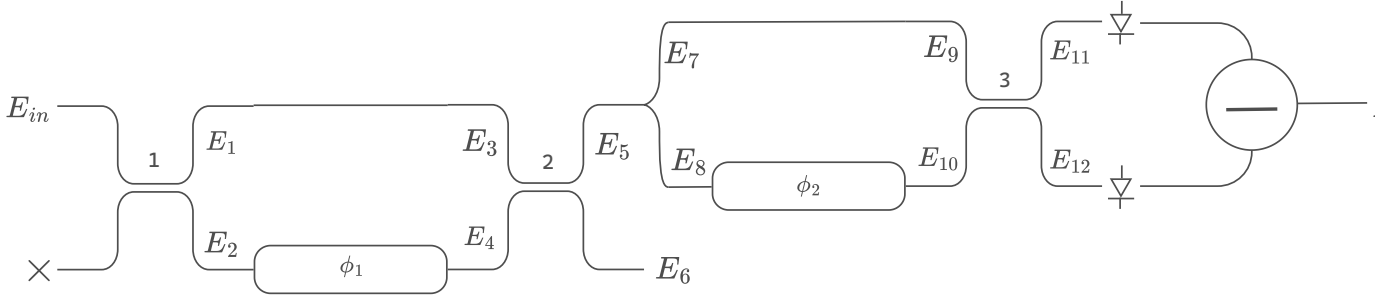


Intensity vs Phases Plot



Intensity vs Phases over a broad range of angles to show periodicity

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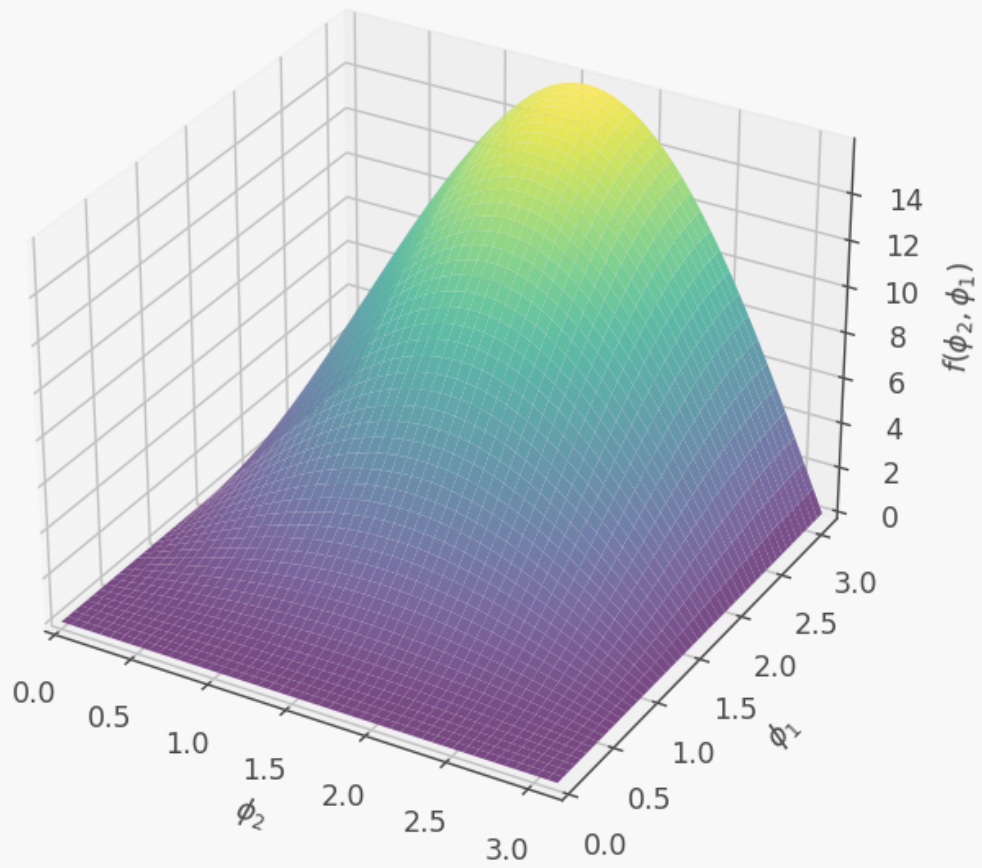
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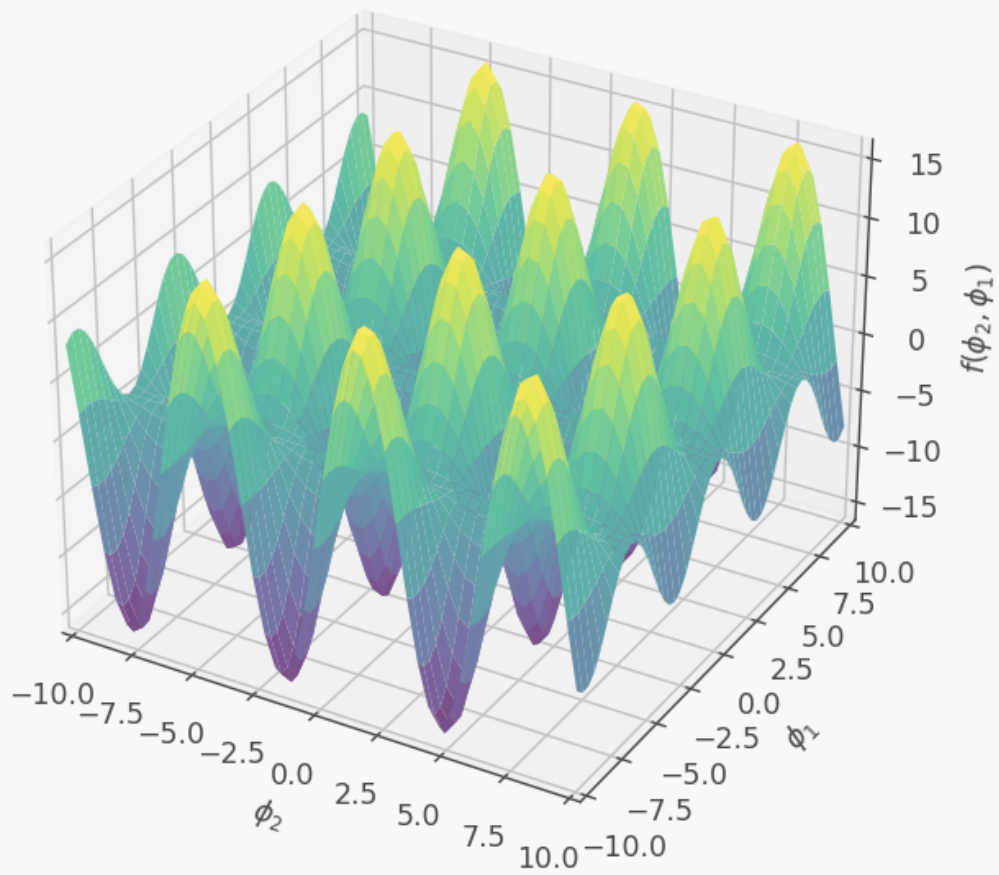
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Plots

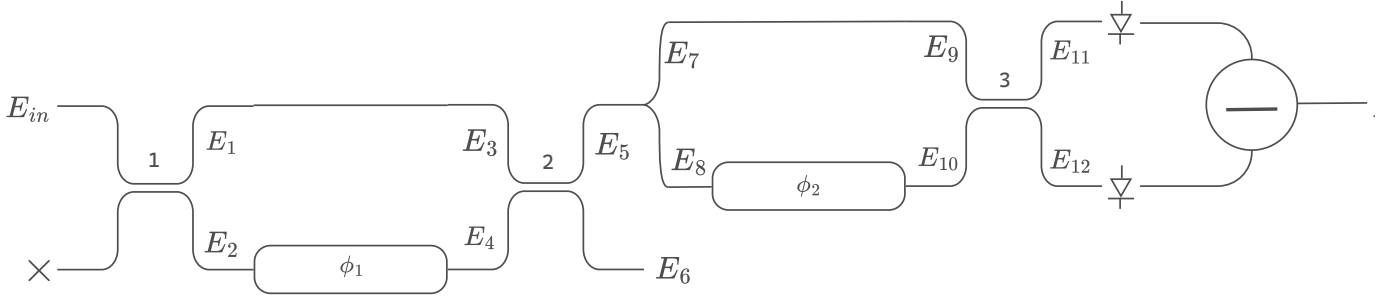


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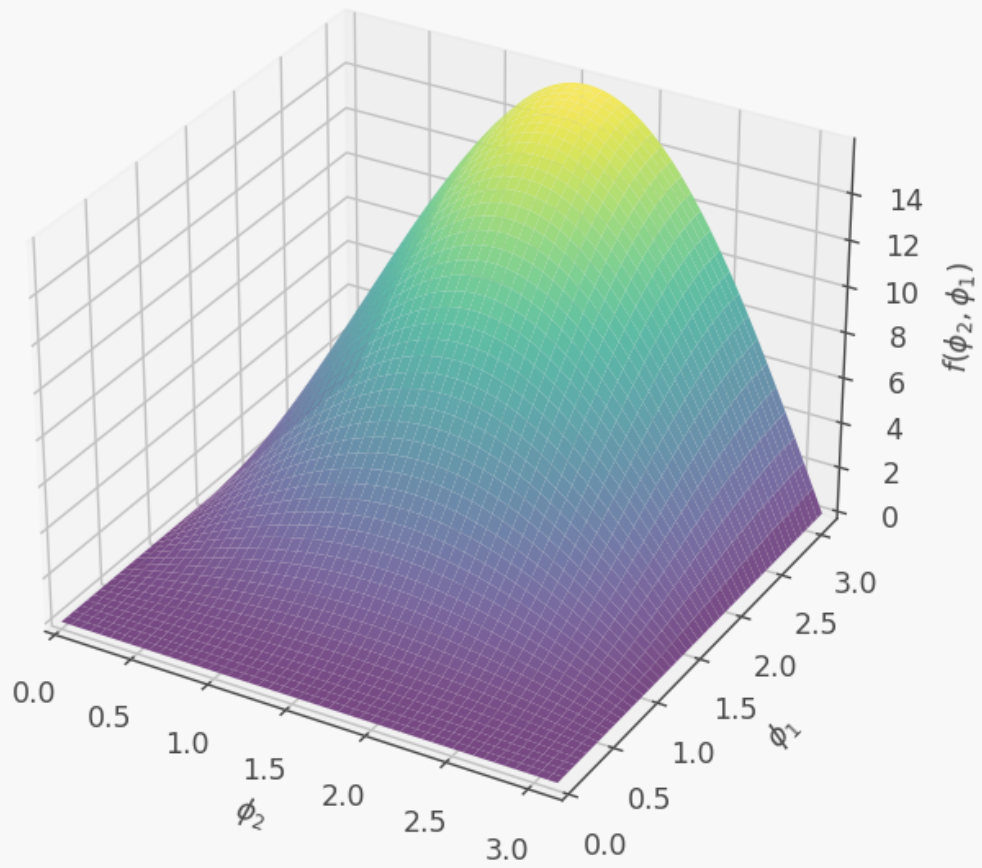
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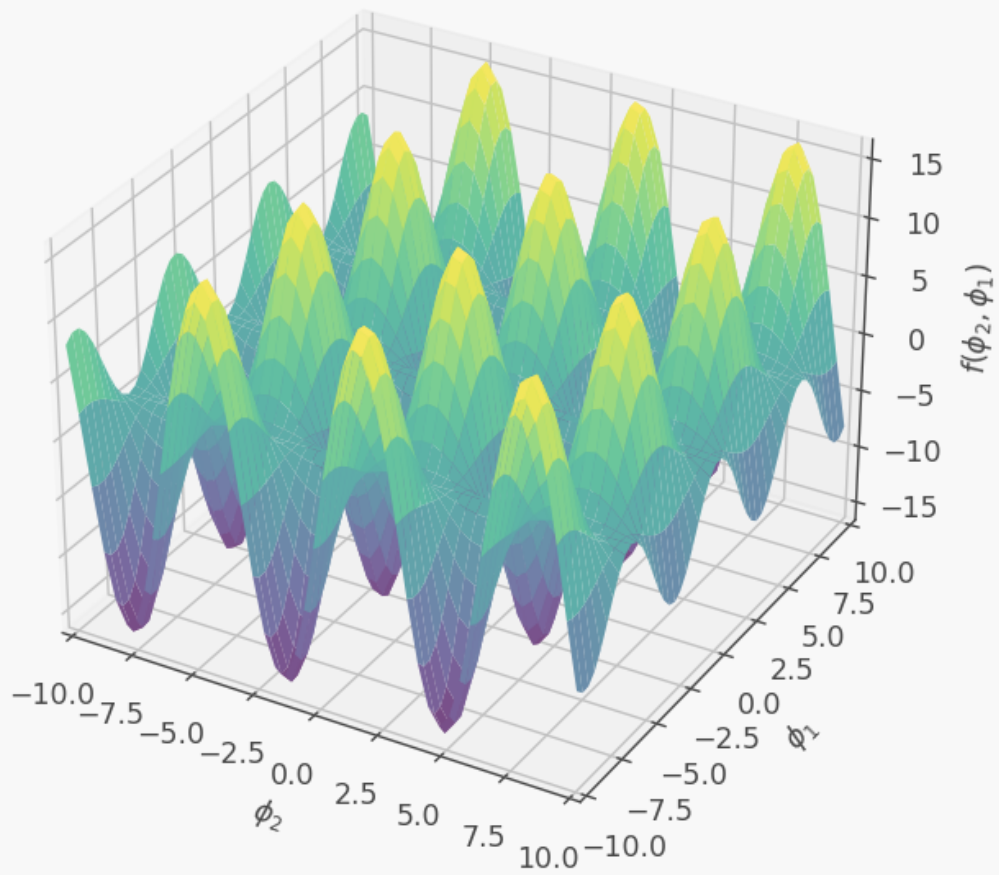
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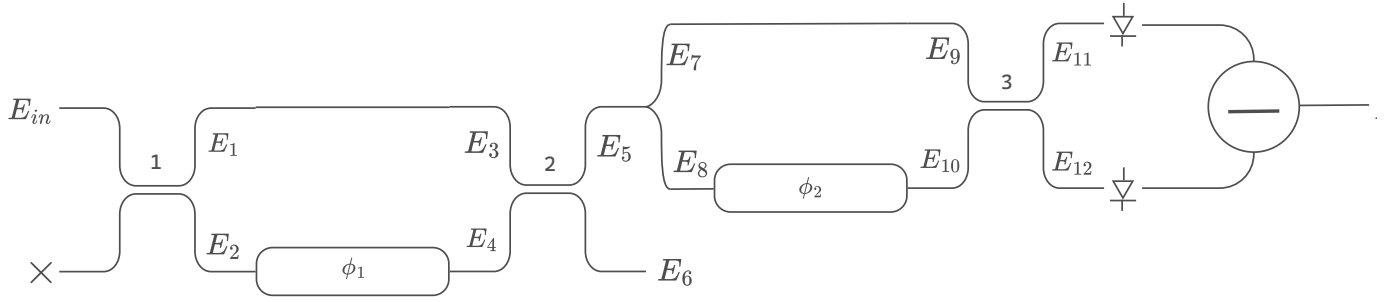


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$$\begin{aligned}\begin{bmatrix} E_5 \\ E_6 \end{bmatrix} &= \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & j \\ j & 1 \end{bmatrix} \begin{bmatrix} E_3 \\ E_4 \end{bmatrix} \\ &= \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & j \\ 1 & j \end{bmatrix} \begin{bmatrix} \frac{E_{in}}{\sqrt{2}} \\ \frac{j}{\sqrt{2}} E_{in} e^{j\phi_1} \end{bmatrix} \\ &= \frac{E_{in}}{2} \begin{bmatrix} 1 & j \\ 1 & j \end{bmatrix} \begin{bmatrix} 1 \\ j e^{j\phi_1} \end{bmatrix} \\ &= \frac{E_{in}}{2} \begin{bmatrix} 1 - e^{j\phi_1} \\ j(1 + e^{j\phi_1}) \end{bmatrix}\end{aligned}$$

Therefore, we get

$$E_5 = \frac{E_{in}}{2} (1 - e^{j\phi_1}) \quad (8)$$

$$E_6 = \frac{E_{in}}{2} j(1 + e^{j\phi_1}) \quad (9)$$

We can ignore E_6 since it is not being used as input.

Therefore, the electric field which represents the inputs of MAC operation can be represented as

$$E_{input} = \frac{E_{in}}{2} (1 - e^{j\phi_1}) \quad (10)$$

MultiMode Interferometer (MMI)

The field is split into two fields having equal power.

Thus,

$$E_7 = E_8 = \frac{E_5}{\sqrt{2}} = \frac{E_{in}}{2\sqrt{2}} (1 - e^{j\phi_1}) \quad (11)$$

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Modulating for Weight Setting

The field which is the output of input modulation is further modulated with weight factor to emulate the multiplication process. We do this process separately to simplify the inputs

Second Modulator

After the modulator ϕ_2 , we get,

$$E_9 = \frac{E}{\sqrt{2}} \quad (12)$$

$$E_{10} = \frac{E}{\sqrt{2}} e^{j\phi_2} \quad (13)$$

Directional Coupler (3)

Applying the transfer function,

$$\begin{aligned} \begin{bmatrix} E_{11} \\ E_{12} \end{bmatrix} &= \begin{bmatrix} \sqrt{1-\alpha} & j\sqrt{\alpha} \\ j\sqrt{\alpha} & \sqrt{1-\alpha} \end{bmatrix} \begin{bmatrix} E_9 \\ E_{10} \end{bmatrix} \\ &= \begin{bmatrix} \sqrt{1-\alpha} & j\sqrt{\alpha} \\ j\sqrt{\alpha} & \sqrt{1-\alpha} \end{bmatrix} \begin{bmatrix} 1 \\ e^{j\phi_2} \end{bmatrix} \\ &= \frac{E_{in}}{2\sqrt{2}} \begin{bmatrix} \sqrt{1-\alpha} & j\sqrt{\alpha} \\ j\sqrt{\alpha} & \sqrt{1-\alpha} \end{bmatrix} \begin{bmatrix} 1 \\ e^{j\phi_2} \end{bmatrix} \end{aligned} \quad (14)$$

Applying $\alpha = \frac{1}{2}$ in eqn (14),

$$\begin{bmatrix} E_{11} \\ E_{12} \end{bmatrix} = \frac{E_{in}}{4} \begin{bmatrix} 1 & j \\ j & 1 \end{bmatrix} \begin{bmatrix} 1 \\ e^{j\phi_2} \end{bmatrix}$$

Expanding,

$$\begin{aligned} E_{11} &= E(1 + je^{j\phi_2}) \\ E_{12} &= E(j + e^{j\phi_2}) \end{aligned}$$

Intensity Reading

For the final output that is the intensity reading, we take,

$$I = |E|^2$$

Taking Modulus for E_{11} and E_{12} , we get,

$$\begin{aligned} |E_{11}|^2 &= |1 + j \cos \phi_2 - \sin \phi_2|^2 \\ &= (1 - \sin(\phi_1))^2 + (\cos \phi_2)^2 \\ &= 2 - 2 \sin \phi_2 \end{aligned}$$

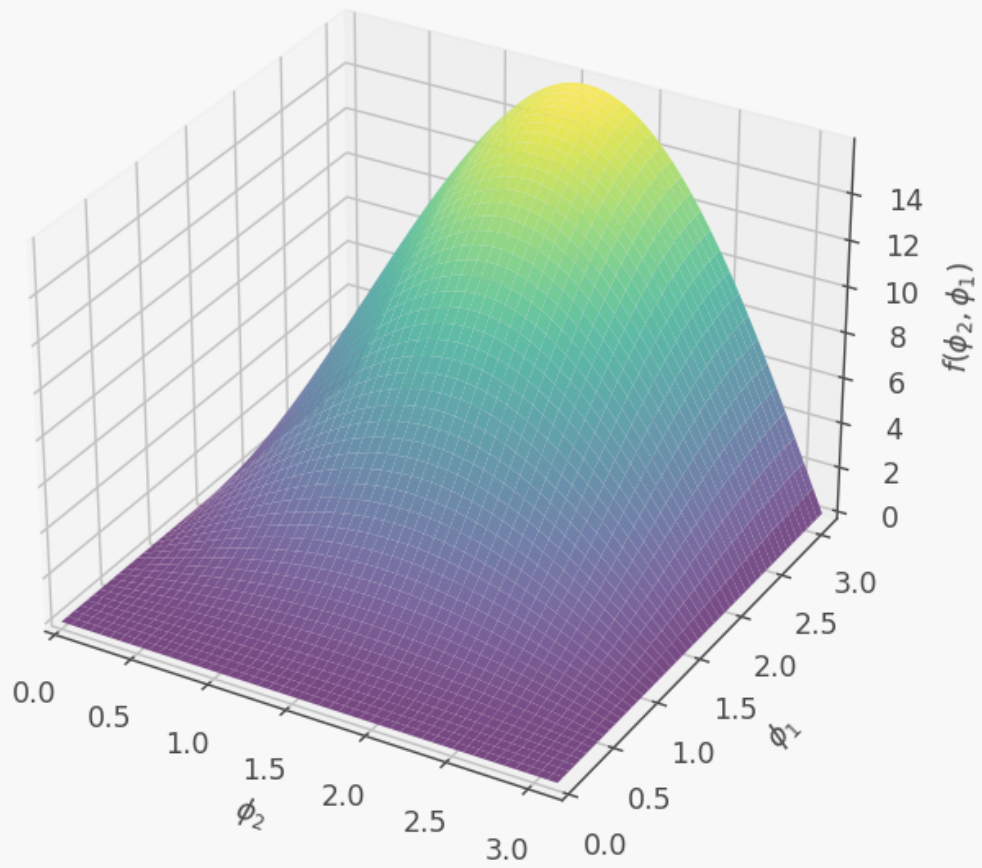
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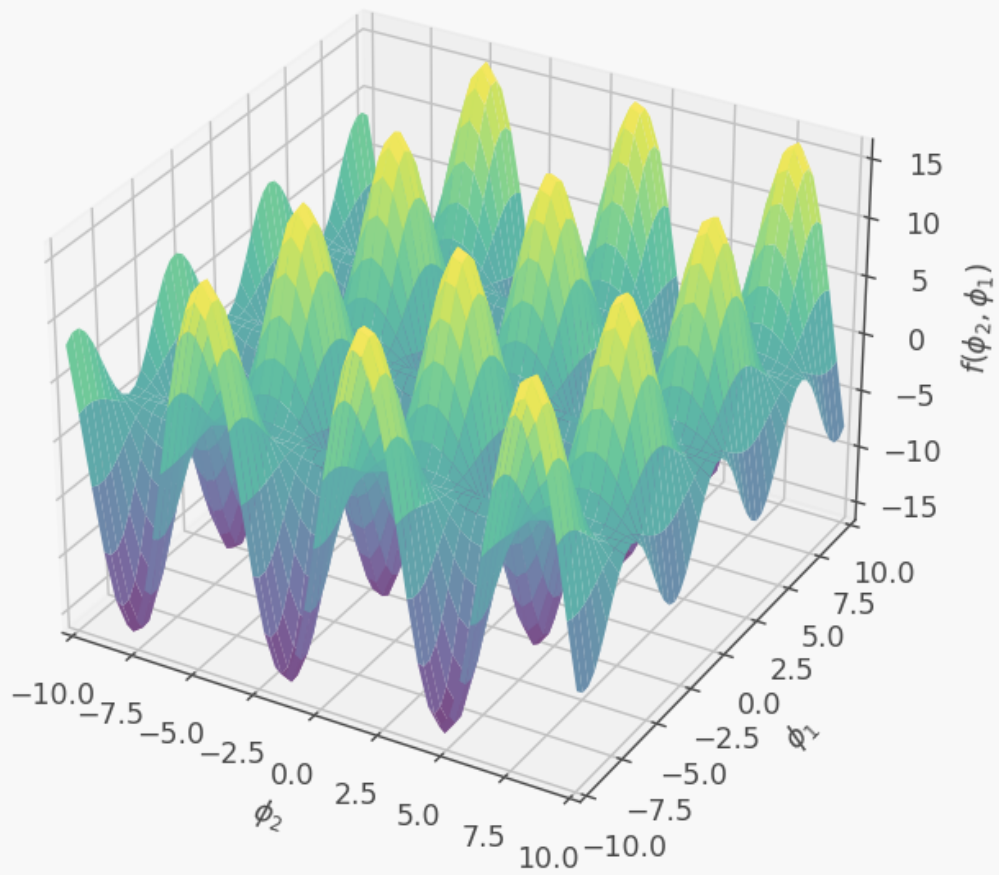
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Plots

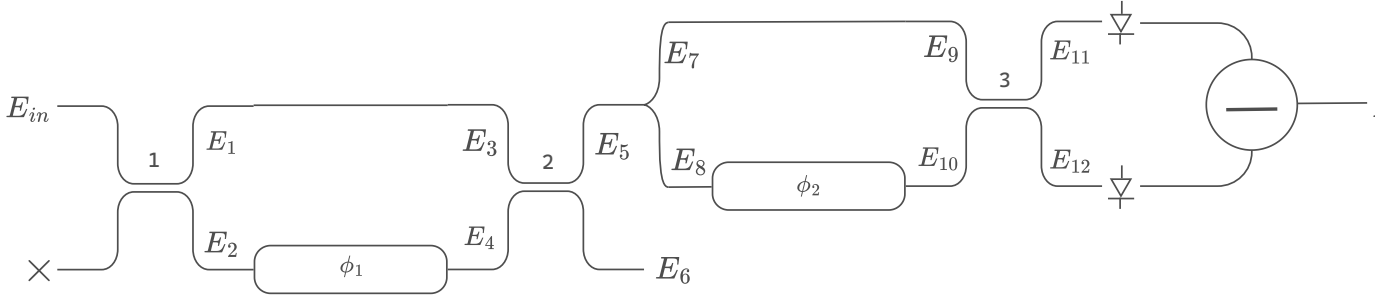


Intensity vs Phases Plot



Intensity vs Phases over a broad range of angles to show periodicity

Diagram



Modulating For Input

For initial directional coupler, input fields are E_{in} and 0.

The transfer matrix of directional coupler is given as follows

$$TM = \begin{bmatrix} \sqrt{1-\alpha} & j\sqrt{\alpha} \\ j\sqrt{\alpha} & \sqrt{1-\alpha} \end{bmatrix} \quad (1)$$

Directional Coupler (1)

Using the transfer matrix matrix defined above, we get

$$\begin{bmatrix} E_1 \\ E_2 \end{bmatrix} = \begin{bmatrix} \sqrt{1-\alpha} & j\sqrt{\alpha} \\ j\sqrt{\alpha} & \sqrt{1-\alpha} \end{bmatrix} \begin{bmatrix} E_{in} \\ 0 \end{bmatrix} \quad (2)$$

Assuming the directional coupler are 50% coupled, we replace $\alpha = \frac{1}{2}$

$$\begin{bmatrix} E_1 \\ E_2 \end{bmatrix} = \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & j \\ j & 1 \end{bmatrix} \begin{bmatrix} E_{in} \\ 0 \end{bmatrix} \quad (3)$$

This gives us

$$E_1 = \frac{E_{in}}{\sqrt{2}} \quad (4)$$

$$E_2 = \frac{j}{\sqrt{2}} E_{in} \quad (5)$$

First Modulator

After the first modulator ϕ_1 , the field is as follows

$$E_3 = E_1 = \frac{E_{in}}{\sqrt{2}} \quad (6)$$

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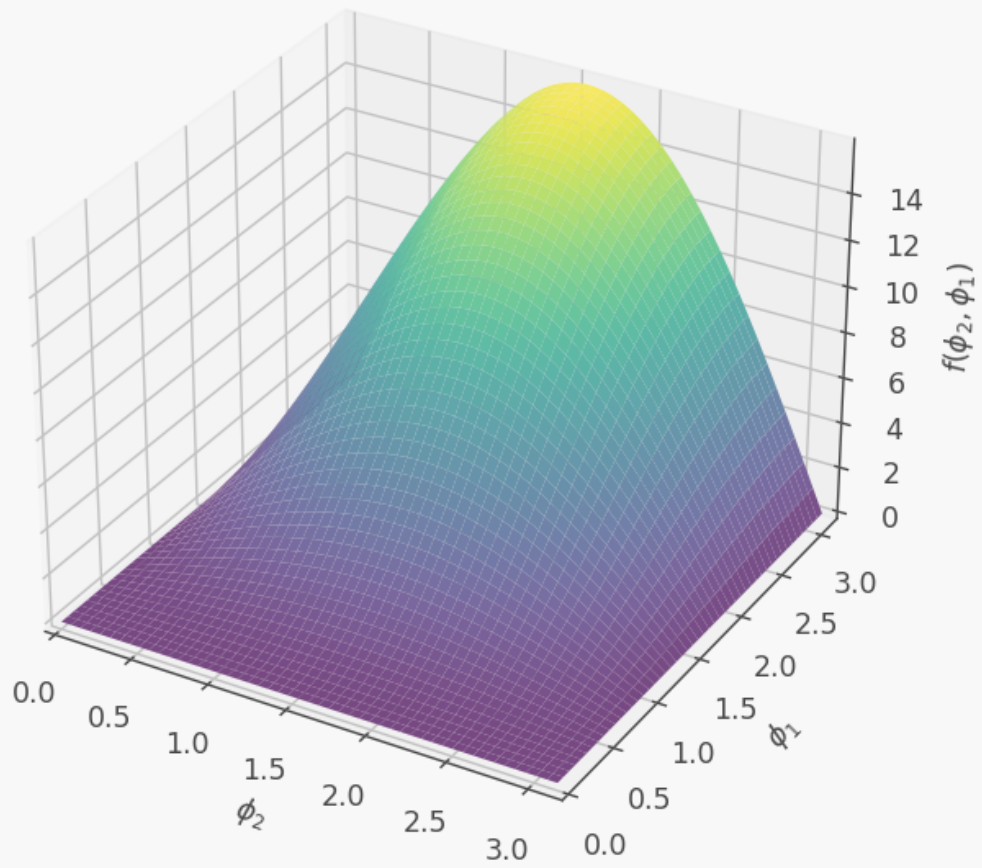
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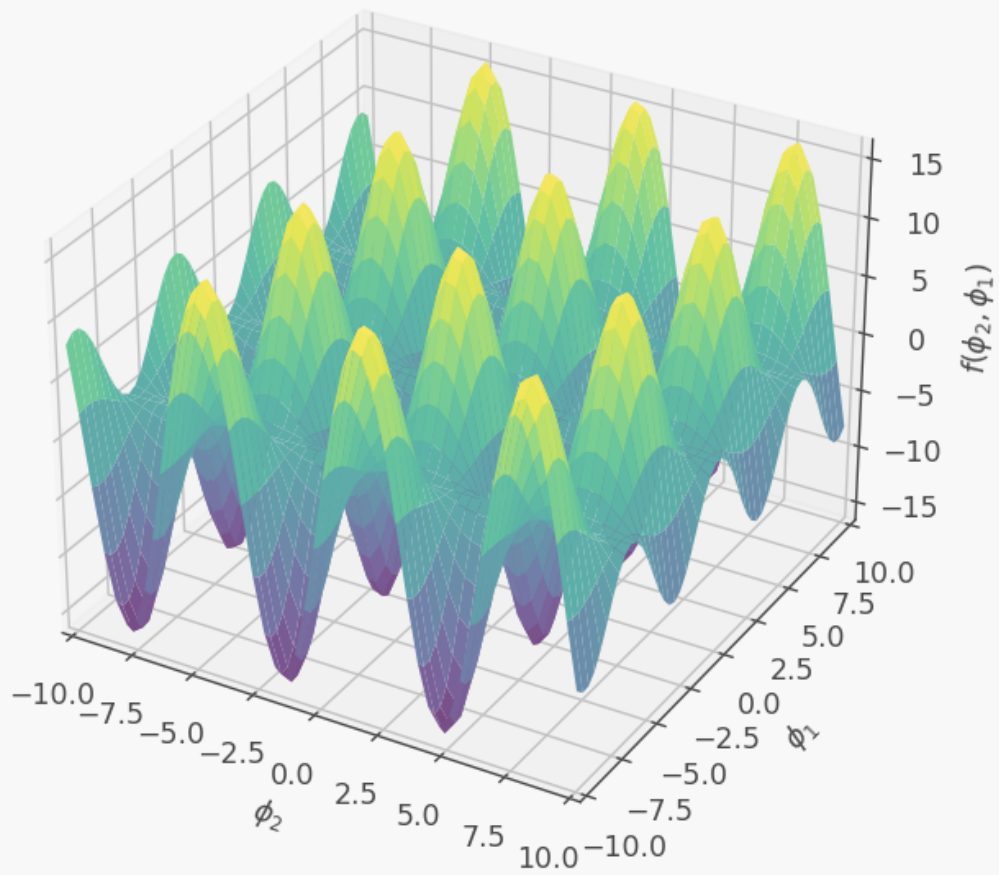
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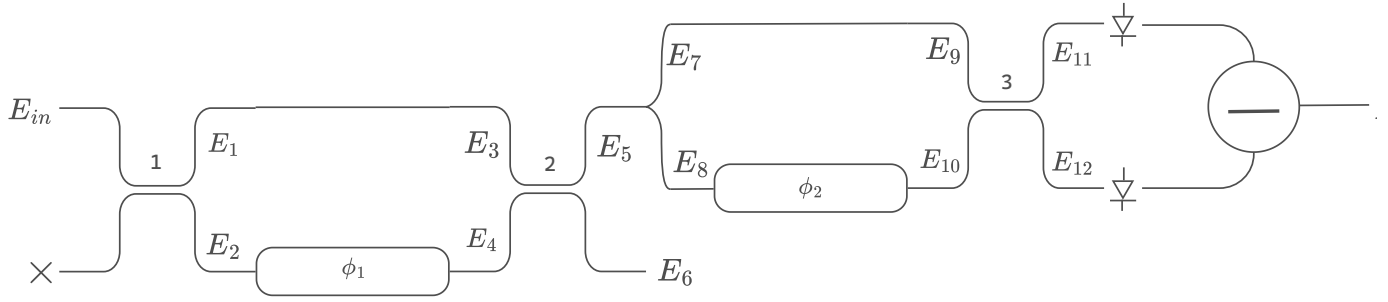


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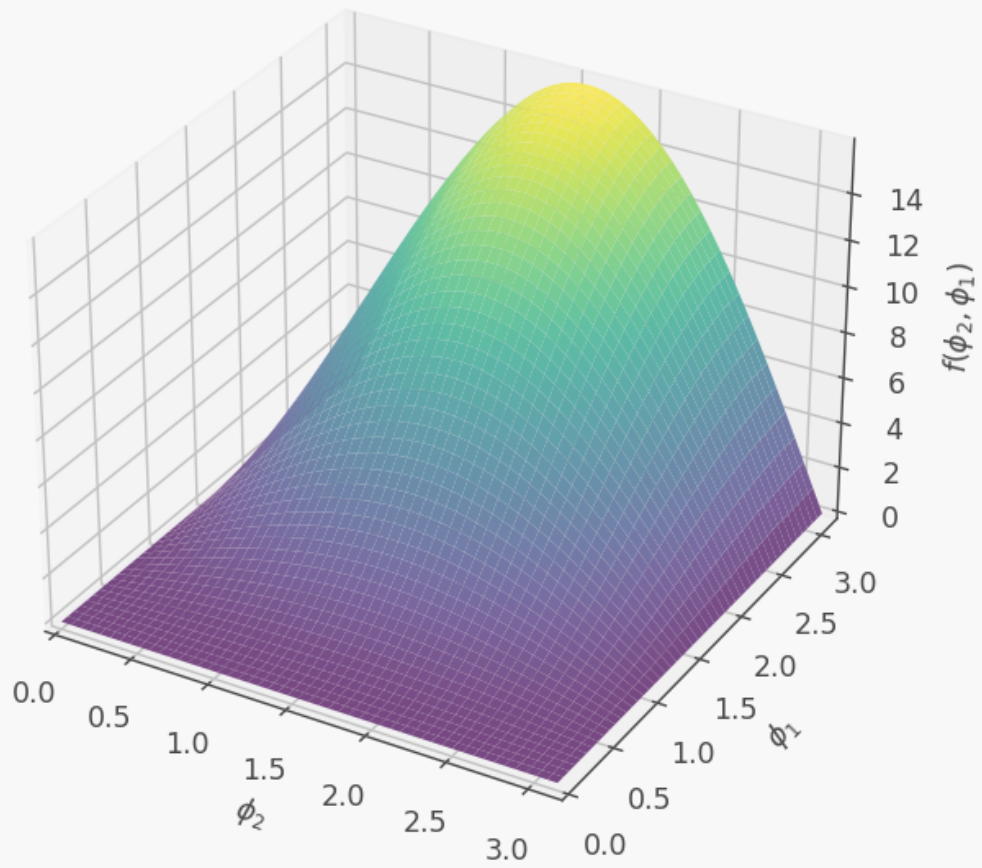
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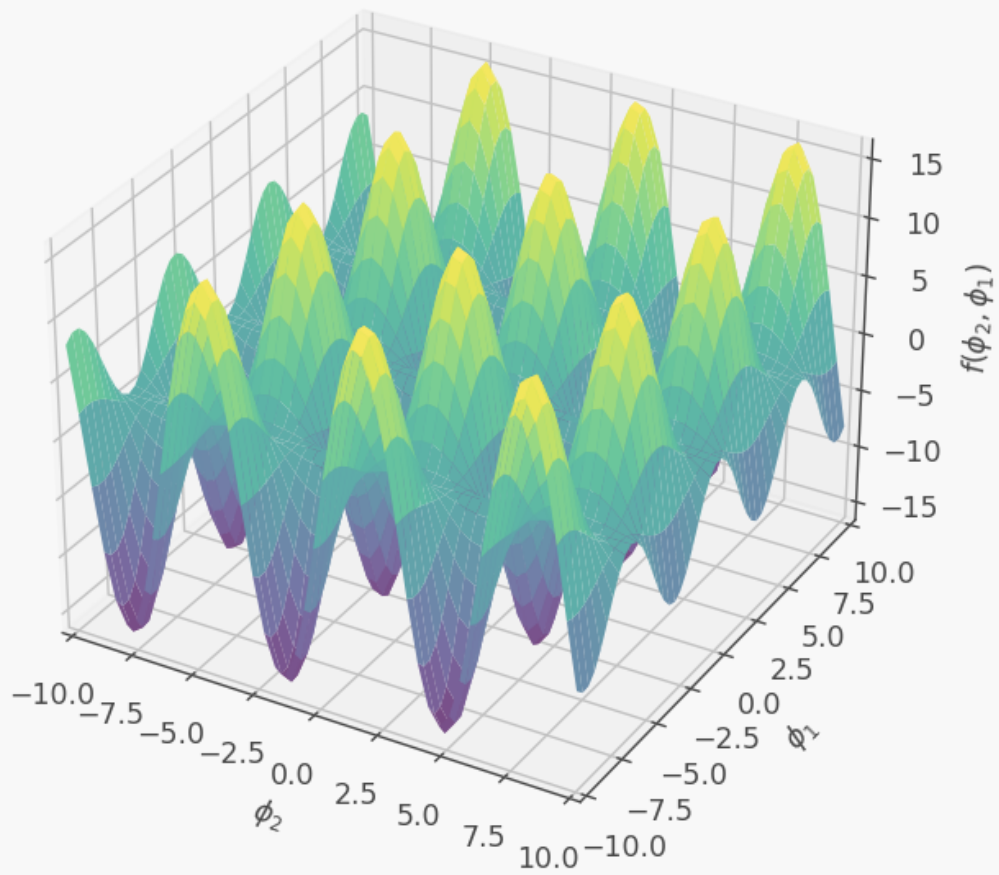
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