如何撰寫提案報告

2010/11/03

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提案報告的架構

要作什麼樣的題目？（描述、確立目標）

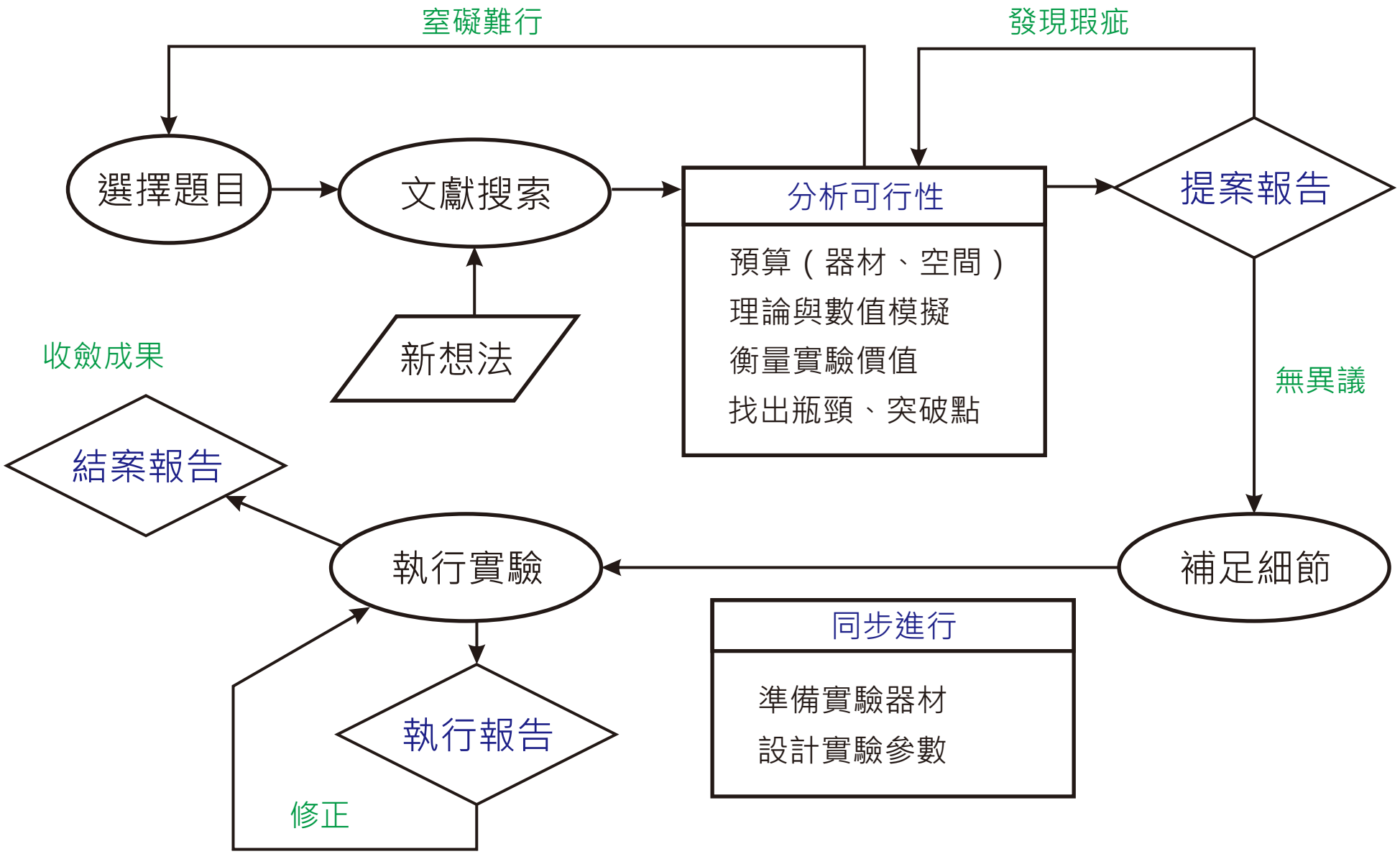
為何要作這個題目？（功能、差異、賣點）

是否瞭解這個題目？（比較文獻、找出優缺點、加入新設計、電腦模擬）

如何進行這個題目？（流程圖、邏輯布局、初步理論分析、規劃實驗架構、時程表、工作分派）

需要哪些儀器？（申請預算、控制預算、調度資源作最大的利用）

完整流程


窒礙難行
發現瑕疵
選擇題目
文獻搜索
分析可行性
預算（器材、空間）
理論與數值模擬
衡量實驗價值
找出瓶頸、突破點
提案報告
新想法
收斂成果
無異議
結案報告
執行實驗
補足細節
同步進行
準備實驗器材
設計實驗參數
執行報告
修正

報告範例

報告類型

報告標題

所屬組別

計畫發起人

Experimental Proposal

Non-collinear Optical Parametric Chirp Pulse Amplifier with fast gain-switched laser diode injection

Proton Accelerator and Plasma Nonlinear Optics Group

Chih-Han Lin 林致翰

報告範例

描述題目

分析

Advantage of OPCPA

- High contrast within few tens picoseconds (avoiding ASE)
  - above 10^{10} contrast around
  - amplified superfluorenscence (ASF) is dominant
  - instantaneous amplification without energy storage

- High single pass gain (10^3~ 10^5 , pump pulse @ GW/cm^2 level)
  - gain is tunable (crystal thickness, pump spot size etc.)
  - Nonlinear crystal with high damage threshold
  - Broadband amplification (700nm ~900 nm) within BBO Noncollinear OPA scheme
  - low B-integral

報告範例

找出瓶頸

條列重點

Technical Difficulty

- Syncronization
  - few tens picoseconds jitter would degrade contrast
  - keep jitter less than 10% of pump pulse duration
- Pump quality requirement
  - BBO has low accept phase matching angle (few mrads)
  - Tight focusing is useless
  - Require high intensity to achieve better conv. efficiency
  - Energy stabilty is poor below saturation regime

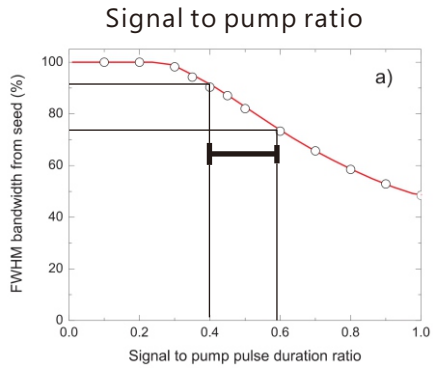
報告範例

補充說明

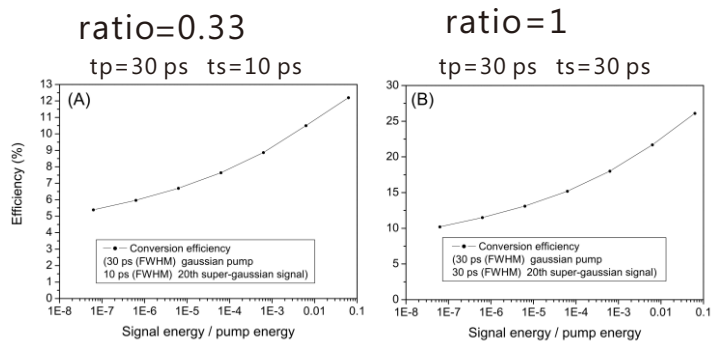
以圖片說明

規劃實驗參數

Pump configuration



ratio= 0.5, 80% amp. BW



conv. efficiency increases with signal pulse duration

TI:S seed pulse after strecher: 170 ps
OPCPA pump duration (1064nm before SHG): 500 ps
OPCPA pump pulse duration (532nm after SHG): 350 ps

報告範例

文獻回顧

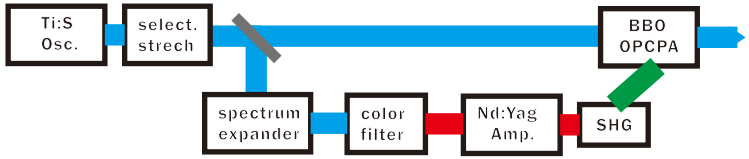
圖片引用註解

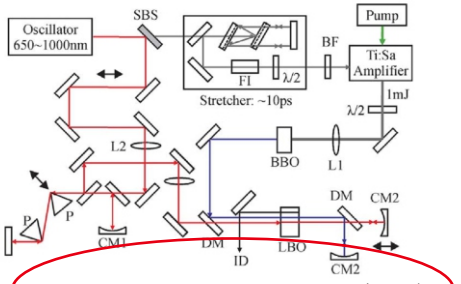
架構簡圖

實體架設

Synchronization Scheme

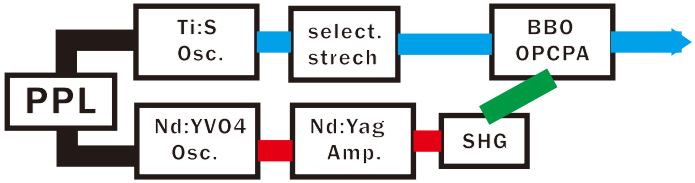
- Optical Sync.

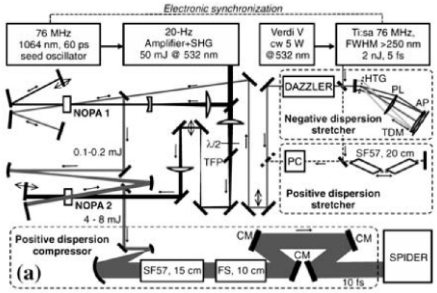




Y. Tang et al. Opt. Lett. 33, 2386 (2008)

- Eletrical Sync.





報告範例

方法

使用表格

評比項目

圖片引用註解

	Electronic synchronization	Optical synchronization
Timing jitter (short term)	< few ps	< 1 ps
Timing drift (long term)	several ten ps	several ps
Wavelength tunability	flexible	flexible within oscillator's spectrum
Coarse timing (coarse timing adjustment required)	everyday realignment required	fixed oscillator rep. rate fixed amplifier path length (fixed round trip)
Seed energy to pump amplifier	high	low (ASE problem)
Handling	complicated	simple
Cost	two oscillators + locking electrics	ultrabroadband oscillator

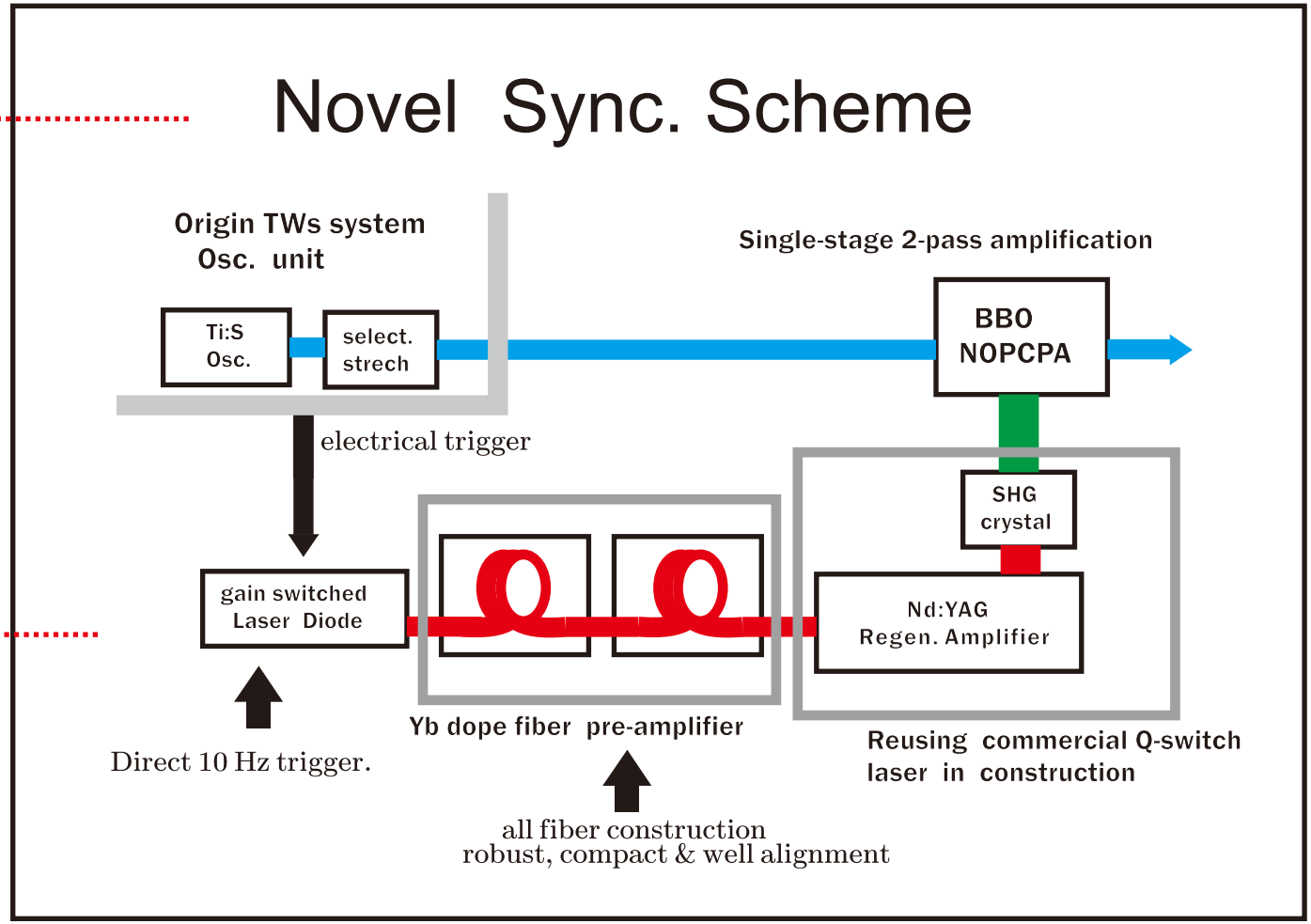
Table B.1: Comparison of electronic and optical synchronization methods

Nobuhisa Ishii, Development of Optical Parametric Chirp–Pulse Amplifiers and Their Applications,-Munchen 2006, Thesis , Appendix.B

報告範例

加入新設計

簡易流程

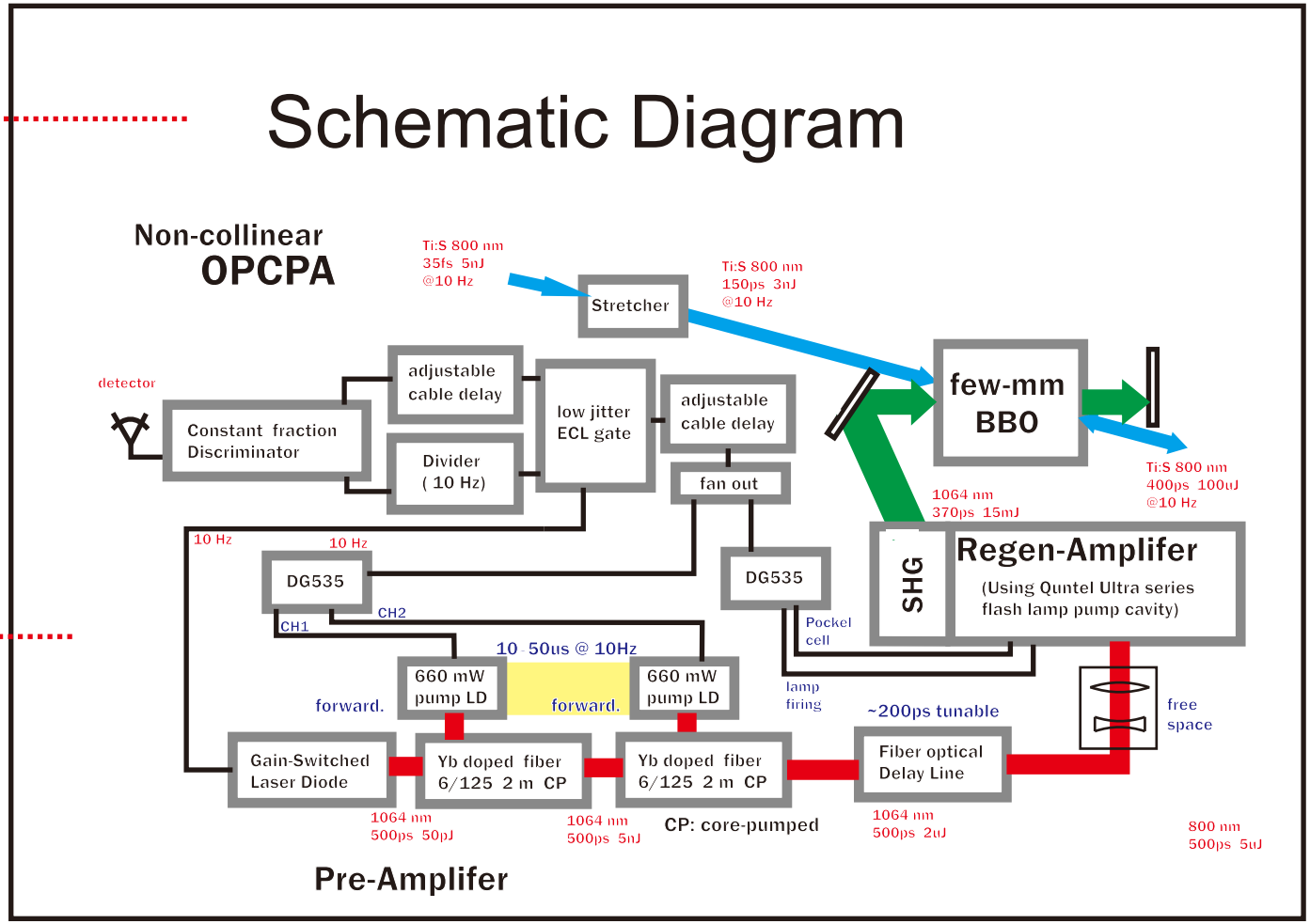


報告範例

描述新設計細節

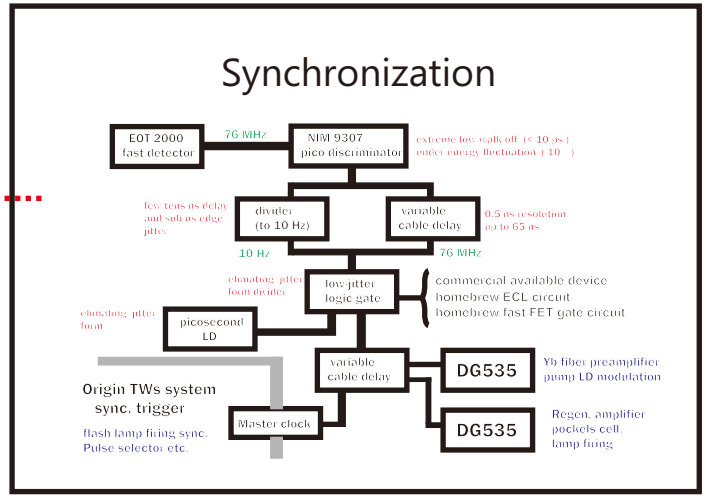
邏輯佈局

描述初步估算參數

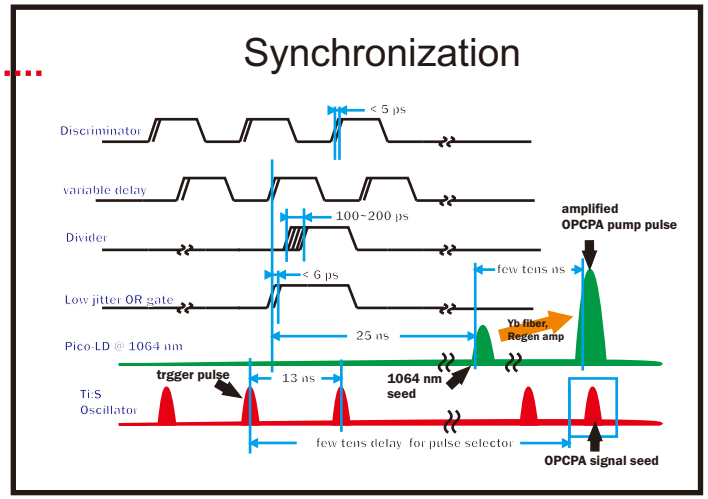


報告範例

描述電子信號流向



以波形圖輔助講解

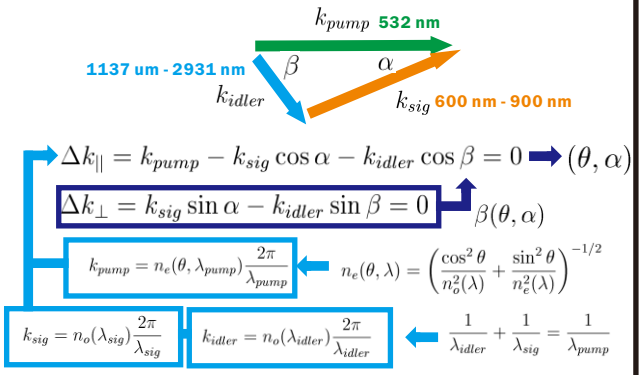


報告範例

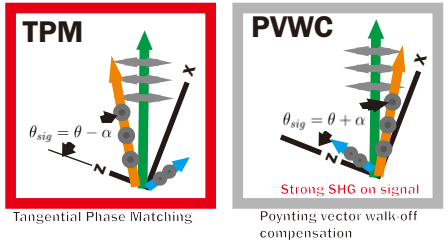
理論分析

數值模擬

Non-colinear PM angle



Type-I NOPA schematic

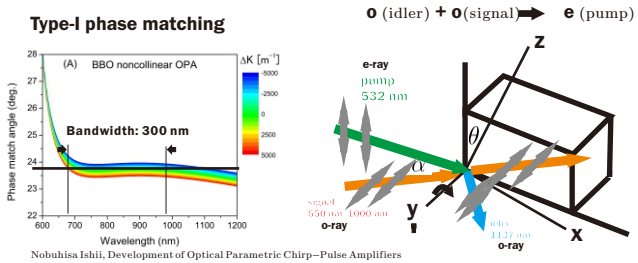


TPM & PVWC have the same phase matching angle (around 24°)

In PCWC scheme, θ_{sig} is close to 26-29° which is the SHG phase matching angle @ 800nm - 900nm in BBO Type-I

TPM would acheve higher gain and conversion efficiency

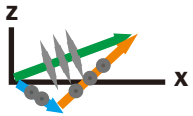
OPA in BBO



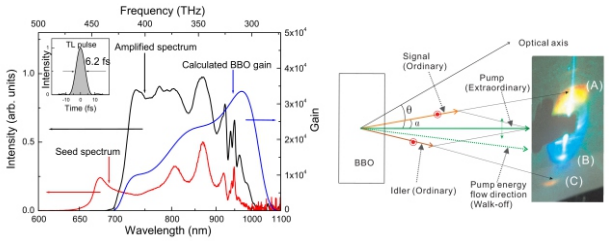
Nobuhisa Ishii, Development of Optical Parametric Chirp–Pulse Amplifiers and Their Applications,Munchen 2006, Thesis ,pp.25

Crystal Cut @ $\theta = 23.6°$ $\phi = 90°$

non-collinear angle $\alpha = 2.4°$



Amplification spectrum & ASF



Nobuhisa Ishii, Development of Optical Parametric Chirp–Pulse Amplifiers and Their Applications,Munchen 2006, Thesis ,pp.35,36

報告範例

核心儀器介紹

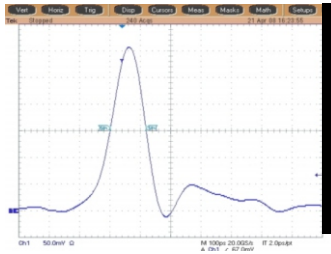
列出儀器重要參數

Picosecond LD module

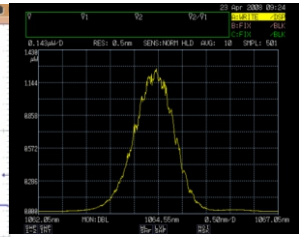
Price: EUR 6,800.00.

ALPHALAS
PICOPOWER-LD-1064--500-FC

Peak power: typ. 200 mW min. 100 mW
Pulse duration: 500 ps
Pulse energy: 50 ~ 100 pJ
Fiber coupled in HI1060 (6/125 single mode)
Fiber Bragg Grating, 0.1 nm stability
Tunable with the temperature, 0.3 nm/°C



temporal waveform



spectrum
1064.5 nm, BW:1 nm

Trigger specification

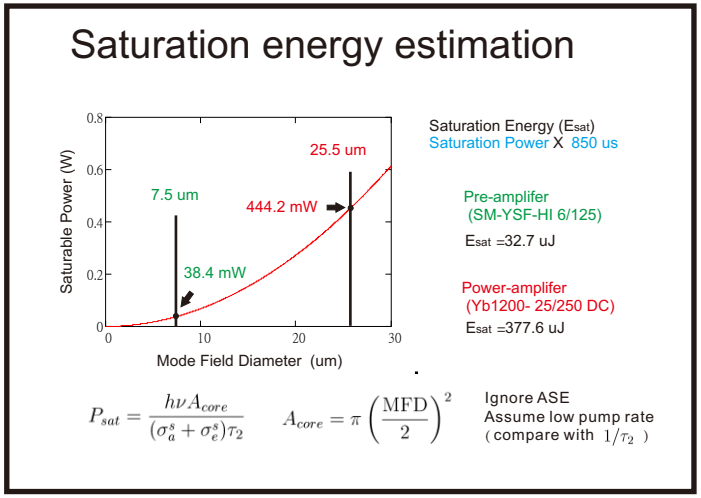
a) connector type: **Standard is BNC**
b) impedance: **50 Ohm**
c) rising time: **<5 ns**
d) minimum trigger pulse duration: **10 ns**
e) input voltage level. **TTL**

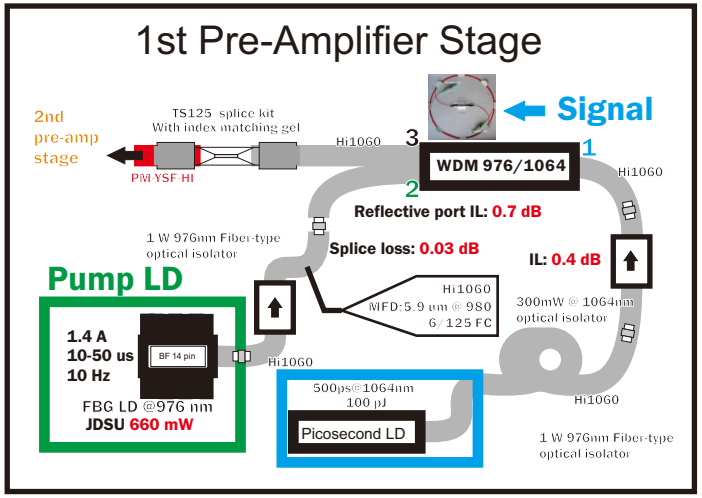
Jitter: < 50 ps, typ. 20 ps.

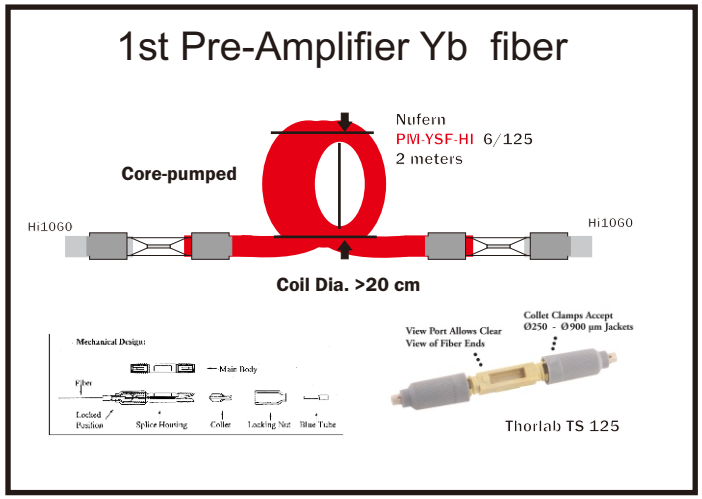
報告範例

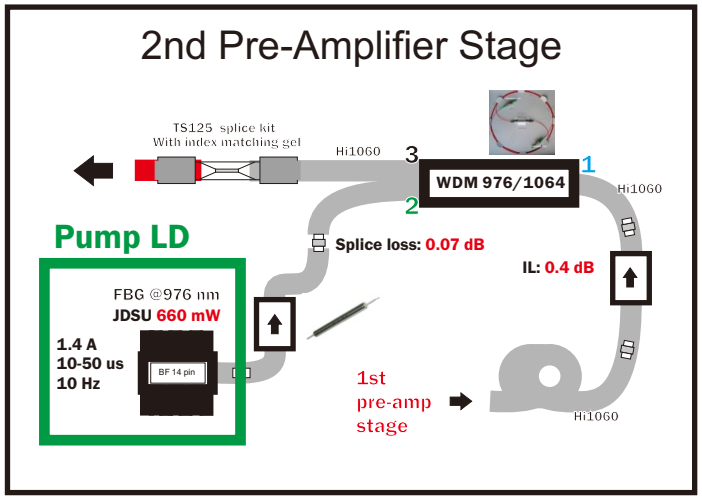
更多細節

實驗架構流程圖



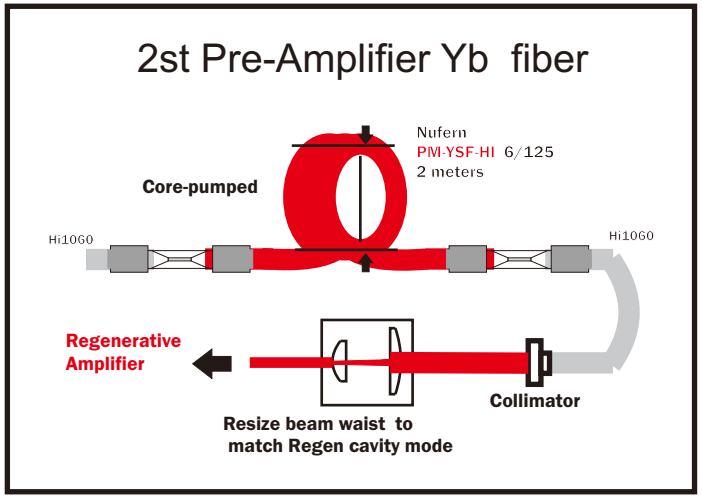


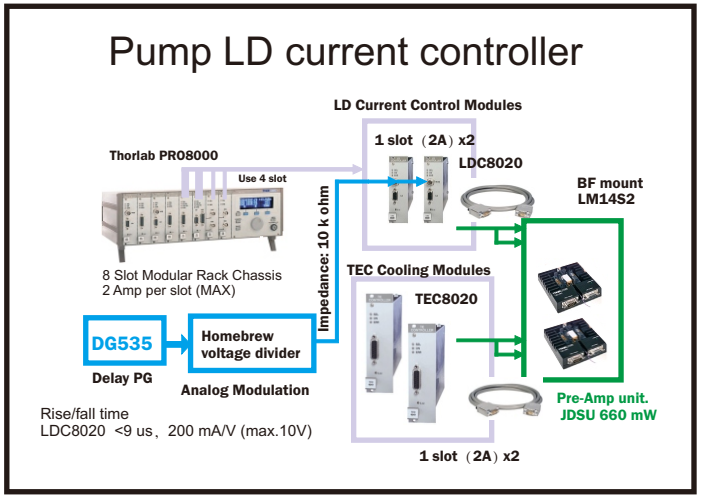




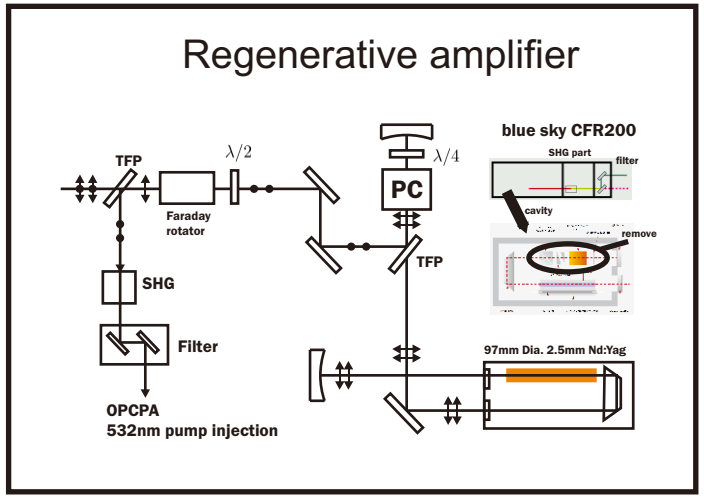
報告範例

更多細節





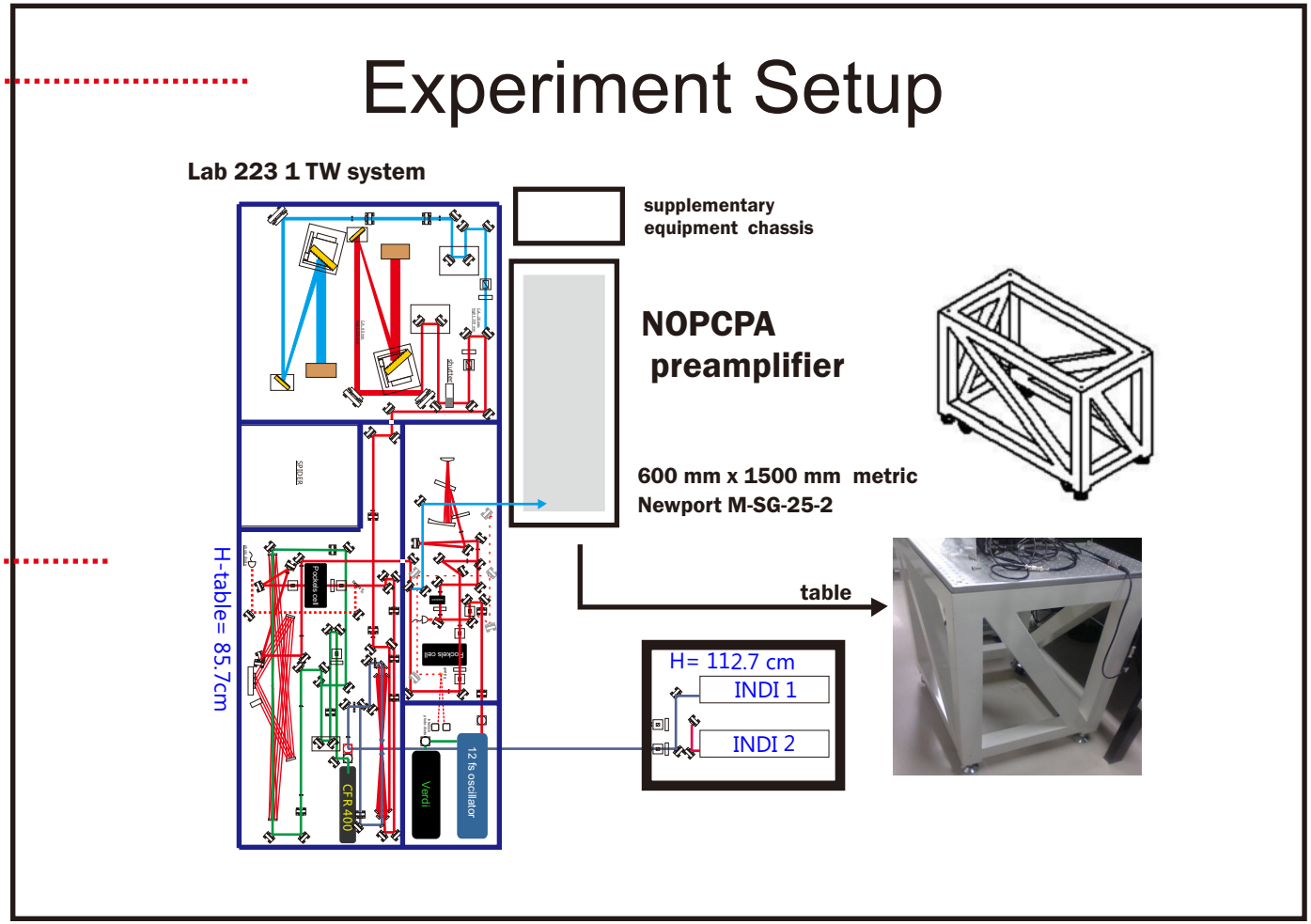
實驗架構
流程圖



報告範例

實體架設圖

空間規劃

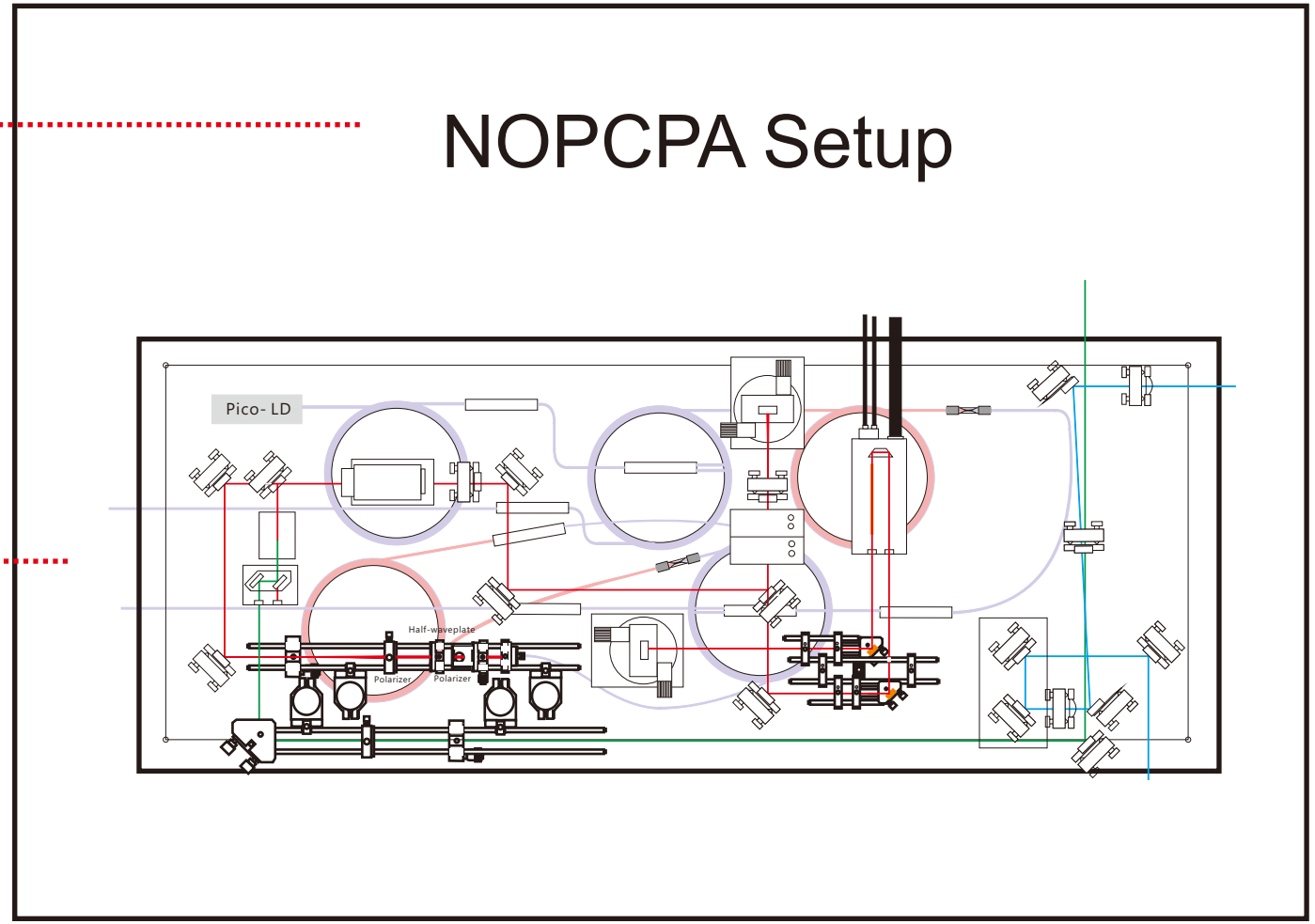


報告範例

實體架設圖

實際比例架設圖

全局概觀

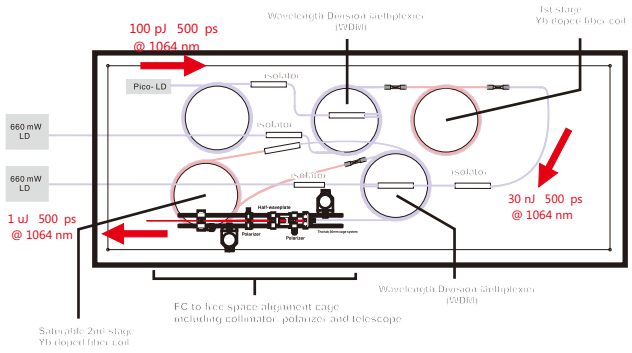


報告範例

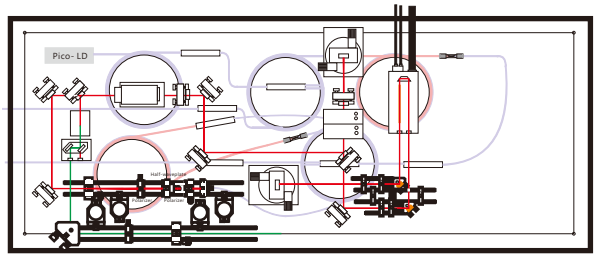
分割

個別解說

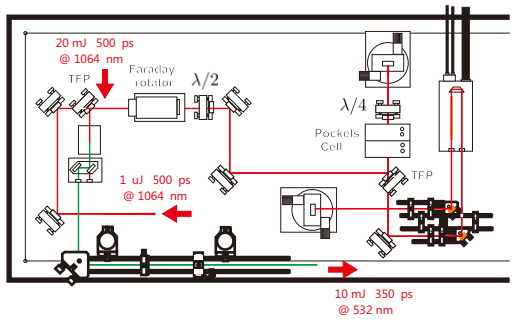
Fiber amplifier Setup



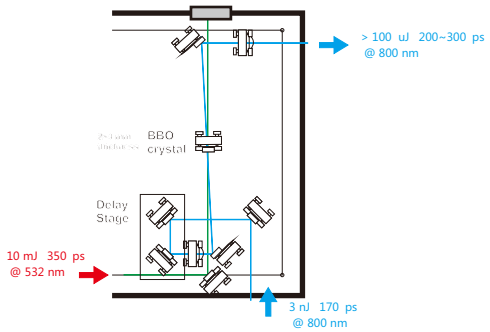
Regen. amplifier Setup



Regen. amplifier Setup



NOPCPA Setup



報告範例

列出總預算

Total budget

Item	budget	Remark.
Fiber preamplifier	500,000 NTD	
Optical components	345,000 NTD	
Electrical equipment	100,000 NTD	
Mechanics	200,000 NTD	
Picosencond LD	310,000 NTD	
Pockels cell & driver	400,000 NTD	
Faraday isolator	50,000 NTD	
Total:	1905,000 NTD	

報告範例

預算子項目

詳細列表

Fiber pre-amplifier (USD)

Name	Price	Qty.	total	Remark.
fiber isolator 300mW	236	2	472	oemarket 1060nm, single mode fiber HI1060, Grade P, FC 900um loose tube, Single
WDM coupler	340	2	680	oemarket (HI1060), 3x, ports (980nm port and 1064nm port): 900um loose tube, FC connectors, output port (common port) : 250um bare fiber, no connector, power handling(max): 1000mW CW
980 Pump LD Filter	266	2	532	oemarket 980 Pump Laser Diode Protection filter, Max. 1000 mW CW
Patch cord	60	6	360	bare fiber to FC connector Hi1060 or similar 6/125 patch cord
GL10–C26	713	1	713	Glan–Laser Polarizer, 10 mm CA, 1064 nm V–Coating
SM–YSF–HI 6/125	150	4	600	Nufern, core pumped , asorb. 250 dB/m
Total	15,079 USD	approx. 500,000 NTD		

Optical components

Name	Price	Qty.	total	Remark.
TFPN–1064–PW–1025–UV	775	2	1550	CVI 45 degree Thin–Film Plate Polarizers 10 J/cm^2 20ns, 20 Hz 1MW/cm^2
QWPO–1064–05–2–R10	515	3	1545	CVI zero oreder quarter waveplate 10 J/cm^2 20ns, 20 Hz 1MW/cm^2
QWPO–1064–05–4–R10	515	2	1030	CVI zero oreder half waveplate 10 J/cm^2 20ns, 20 Hz 1MW/cm^2
0.5″ 1064nm HR	145	2	290	CVI 99.5% laser line mirror，1064nm
Y1S–1025–0	650	2	1300	CVI 99.98% laser line mirror，1064nm
Y1–0537–45–UNP	145	4	580	CVI 99.5% laser line mirror, 1064nm
TLMB–800–45–1025	335	5	1675	CVI Ultra broadband mirrors
Y2–1025–45–P	120	2	240	CVI 99.5% laser line mirror， 532nm
1″ Lens	375	6	2250	SF11 1064 AR coating estimation
Total	10,460 USD	approx. 345,000 NTD		

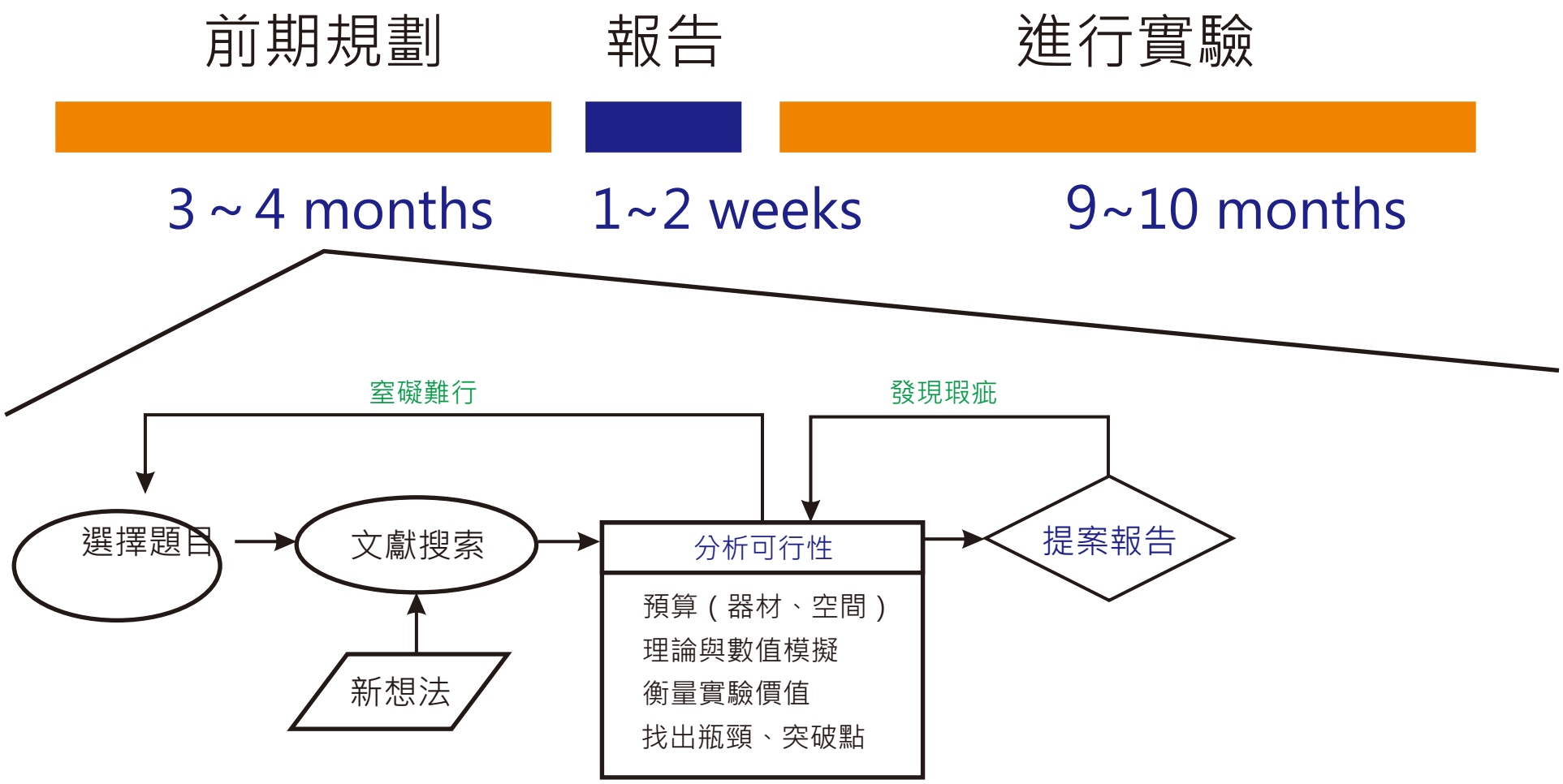
Mechanics (USD)

Name	Price	Qty.	total	Remark.
CP03/M	18	2	36	Thorlab 30mm cage system 35 mm Ape, 30 mm Cage Plate, 0.35″ Thick
CP01/M	16	2	32	Thorlab 30mm cage system Blank Cage Plate, 30 mm, 0.35″ Thick
SP05/M	30	2	60	Thorlab 30mm cage system 30 mm to 16 mm Cage Adapter Plate
ER1	5	8	40	Thorlab 30mm cage system Cage Assembly Rod, 1″ Long, Ø6 mmc
KCB1	104	1	104	Thorlab 30mm cage system Right Angle Kinematic Mirror Mount 30 mm
KCB05	108	2	216	Thorlab 30mm cage system Right Angle Kinematic Mirror Mount 1 mm
others	2000	1	2000	estimation
optical table	1000	1	1000	600mm x 1500 mm x 880 mm without breadboard
Total	6,140 USD	approx. 200,000 NTD		

Mechanics (USD)

Item	Price	Qty.	total	Remark.
			545	Thorlab 30mm cage system
SM1Z+SM1RR			1360	Thorlab 30mm cage system
HPT1			322	Thorlab 30mm cage system
C1526/M			29	Thorlab 30mm cage system
VRC4CPT			573	Thorlab 30mm cage system
CRM1P/M			200	Thorlab 30mm cage system
ER18			40	Thorlab 30mm cage system
ER8			28	Thorlab 30mm cage system
ER4			36	Thorlab 30mm cage system

報告範例


前期規劃
報告
進行實驗
3 ~ 4 months
1~2 weeks
9~10 months
窒礙難行
發現瑕疵
選擇題目
文獻搜索
新想法
分析可行性
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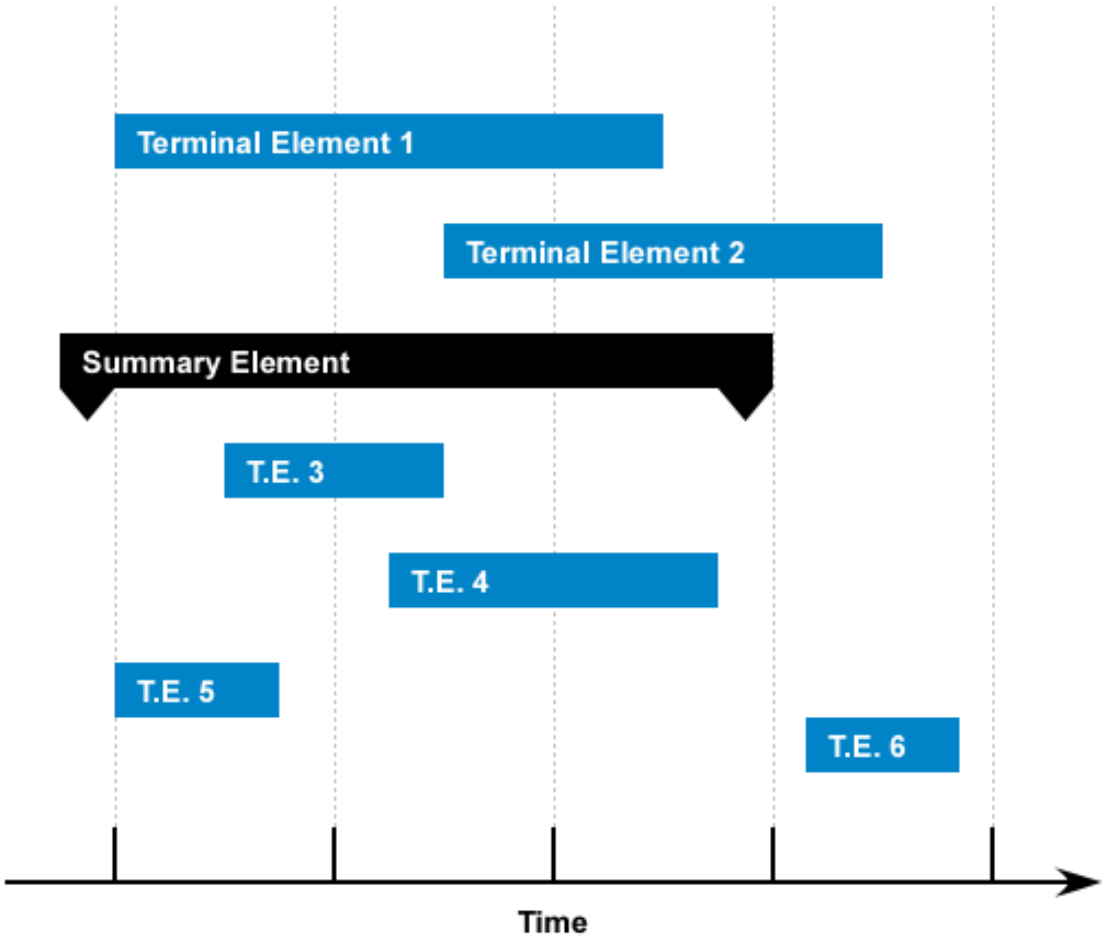
理論與數值模擬
衡量實驗價值
找出瓶頸、突破點
提案報告

時程規劃

使用甘特圖（Gantt chart）進行安排



甘特圖

使用 opensourse 軟體繪製

http://www.ganttproject.biz/download

使用 Excel 繪製

http://support.microsoft.com/kb/254008/zh-tw

再詳細的計畫，若缺乏持續執行的意志力，仍屬空談