

Week 18

2022.12.31

Saturday

1. 物理所:



- ① 优化基组: ② 看量化书

标准方法: DFTZP
↓
QZP? ✓
energy ↓ ✓
s2QP
idea!
只优化 E_{CRPA}
 TZP (DZP)

2. QGP: 2.76/5.02 TeV

ddl: 3.10 { 绿连
译文 EZ
中期 EZ

{ QGP
DeepH: 理论 \rightarrow 实用. 做事: 比较
DFT & DeepH
同一个 HSE 矩阵 算出不同性质.
Basis: E_g atom (NAO-VCC: atom E_{tot}
(THz: Period E_C^{RPA})

看书 {
场论. bilibili 张量分析.
Feynman diagram Ch2.
群论 (知乎? fast.) 平场场
文献、量化. 讲座
量力解 H_2 . 数理方法

每周 Exercise:

1. 科研: 物理所 / QGP
2. 英语: { 单词 ↓
听力 ↑

3. 课程: 看书

4. 健身: { 腹部
哑铃

回校后: RUN

Attention!

健身

场论

力学

听力

Week 15 Last modify: 12.9 20:15	Scientific Research	Study	Others.
一		Priority	Priority:
二		1. 场论 (高群) 2. 复习数理	1. 运动
三		H量 ect. (fast)	2. 科一 3. 听力
四		3. 量化 + left 2 basis refs	3. 学歌 4. 看书
五		平均场讲座	5. 看书
六		4. [linux & C++]	
七			

QGP:

2022/11/18

$\text{J}/\psi \sqrt{5.82}$
 $\text{SS} \quad \text{J}/\psi \beta L \rightarrow 1.0$
 $2P^* \quad \text{test}$
 $4.0 \times D_0 \beta L \rightarrow 3.5$
 $D_s \beta L \rightarrow 2.9$
 $\beta L \rightarrow 2.9$
 $D_s \beta L \rightarrow 2.9$
 $v_T \rightarrow 0.3$
 $\gamma_s \rightarrow 0.5$
 $\beta L \rightarrow 2.9$

2022/11/20

$\text{J}/\psi \beta L \rightarrow 0.8$
 $D^0 \beta L \rightarrow 4.0$
 $D_s \beta L \rightarrow 4.0$
 SS 大了
 $D_s \beta L \rightarrow 4.0$

2022/11/19

2.76 5.02

$\text{SS } D^0 \beta L \rightarrow 3.8$
 $4.0 \times \text{小}$
 $3.5 \times$
 $\text{J}/\psi \beta L \rightarrow 1.5$
 $D^0 \beta L \rightarrow 3.8$
 $D_s \beta L = 2.9$
 看看 SS(I)
 $\text{先调 } \beta L, \text{ 再 } TS_{TT}$
 $v_T \rightarrow 0.2$
 $\gamma_s \rightarrow 0.3$

2022/11/21

$\text{J}/\psi \beta L \rightarrow 1.5$
 $D^0 \beta L \rightarrow 5.0$
 $D_s \beta L = 4.0$
 $\text{效果 } \Rightarrow \begin{cases} C: \beta L = 3.0 \\ g: \beta L = 5.0 \end{cases}$

2022/11/22

$\text{J}/\psi \beta L \rightarrow 1.0$
 $D^0 \begin{cases} g: 7.0 \\ C: 3.0 \\ l: 5.0 \end{cases}$
 $D_s \begin{cases} g: 7.0 \\ C: 3.0 \\ l: 5.0 \end{cases}$
 $D_s \begin{cases} g: 6.0 \\ C: 2.0 \\ l: 4.0 \end{cases}$

2022/11/20

$\text{J}/\psi \beta L \rightarrow 1.0$
 SS 大-点点
 $D^0 \beta L \rightarrow 3.9$
 $4.0 \times \text{小}$
 $3.8 \times$
 SS 大.
 $D_s \beta L \rightarrow 2.39$
 SS 大了

大四上 Targets:

1. 完成朱老师处. 本研 ing
 2. 拿到驾照 △
 3. 身体变强. △
 4. QFT 等课程学好
 5. 物理所科研有所进展. ing
 - (6.) 学习一门早想学的爱好.
e.g. 素描人像, 国画.
one more time △ 看本书, 钢琴.
 7. IELTS 7.0 ↑ } 需要花时间
- Books:
活着 ✓
浮世悠悠

Week 12

SR

一 Meeting

二 用新 fik 将 2.76、5.02 都算一遍。✓

bug: 3.0 abacus $r_{cut}=6$

三 } 生成基组有问题，只有 19 个 c ↑ 改进 BL.

四 } 计算 energy ✓

Problem! $\xrightarrow[1 \times 1 \times 1]{KPI?}$ $4 \times 4 \times 4$ ✓

五 } 检验 basin-hopping，能带结构 ✓

从 D2P 出发 状态

test: 只优化-

组轨道，今晚。

之前: 3.0 abacus

不能正常生成
 K_B band-structure
 \downarrow
rpa problem!

七 看一看结果，做 ppt、notes.

2.76 TeV J/ψ

$$T(P_T) = \frac{C}{P_T} e^{-P_T/T}$$

↑

$$R_M = g_M \frac{P_1 P_2}{P_T} \delta(P_1 + P_2 - P_T)$$

$$TT : \underbrace{T_C, C_C}_{(T_S, C_S)}, \quad g_M$$

$$TS : T_C, C_C, g_M, \gamma_0, q_0$$

$$S_j(P) = \sum_{i=C, g} \int dq \quad F_i(q) \cdot \text{Quench } F(q) \cdot S_i^j\left(\frac{P}{q}\right) \cdot \text{Quench } S(p)$$

$$\gamma_i(q) = \frac{\gamma_0}{1 + (q/q_0)^2} \quad \begin{array}{l} i=g, \gamma_0 = P(1) \\ q_0 = P(2) \end{array}$$

$$S \sim \frac{\gamma_0^{-1}}{q_0 \times}$$

$$\begin{array}{l} i=C \\ i=L, S, \gamma_0 = P(1)/2 \\ q_0 = P(2) \\ P = [4.5, 7] \end{array}$$

$$SS^{(1)} : \gamma_0, q_0, (FF_S)$$

$$SS^{(2)} : g_M, \gamma_0, q_0, \Gamma \sim 0.1$$

$$\text{Summary} : T_C, C_C, P(2) \left\{ \frac{\gamma_0}{q_0}, g_M, \Gamma \right.$$

$$1. \quad \begin{matrix} SS^{(1)} \\ + \\ SS^{(2)} \end{matrix} \xrightarrow{\text{high } P_T} \gamma_0 \longrightarrow g_M$$

$$2. \quad \begin{matrix} TT \\ TS \end{matrix} \xrightarrow{\text{low } P_T} C_C$$

	<u>C_c</u>	<u>T_c</u>	<u>γ_0</u>	q_0	<u>g_M</u>	T'
ϕ	11.0	0.51	4.5	7.0	0.432	0.1

2.76

J/ψ	0.5 ~ 1.9	0.5 ~ 1.5	1	0.1
D^0	0.5	0.3	1	
D_s			1	

$$m_u = 0.26$$

$$m_s = 0.46$$

$$m_c = 1.28$$

fit

$$R.P. : R_M = \frac{1}{B(a,b)} \left(\frac{P_1}{P}\right)^a \left(\frac{P_2}{P}\right)^b \delta\left(\frac{P_1}{P} + \frac{P_2}{P} - 1\right)$$

$$D^0 \quad \frac{1}{B(1,5)} = 5$$

$$\left\{ \begin{array}{l} R_M = \underline{g_M} \frac{P_1}{P} \frac{P_2}{P} G_M \left(\frac{P_1}{P}, \frac{P_2}{P} \right) \\ G_M = \frac{1}{B(a+1, b+1)} \left(\frac{P_1}{P}\right)^a \left(\frac{P_2}{P}\right)^b \delta\left(\frac{P_1}{P} + \frac{P_2}{P} - 1\right) \\ \frac{y_1}{y_2} = \frac{m_1}{m_2} = \frac{a+1}{b+1} = \frac{1}{5} \end{array} \right.$$

$$\text{Kaon: } \begin{array}{l} a=1 \\ b=2 \end{array} \quad 12$$

$$D^0 : \frac{5 g_{D^0}}{P P_0} \int \int \frac{dP_1}{P_1} \frac{dP_2}{P_2} C P_1 e^{-P_1/T} C_c P_2 e^{-P_2/T_c} \left(\frac{P_1}{P} \right)^1 \left(\frac{P_2}{P} \right)^5 P d(P_1 + P_2)$$

$$a=0$$

$$b=4$$

$$\frac{1}{B(1,5)} = 5$$

$$T T = \frac{5 g_{D^0} C C_c}{P_0 P_T^6} \int_0^{P_T} dP_1 P_1 e^{-P_1/T} (P_T - P_1) e^{-C(T - P_1)/T_c} (P_T - P_1)^4$$

$$T S = \frac{5 g_{D^0}}{P_0 P_T^6} \int_0^{P_T} dP_1 P_1^4 (P_T - P_1)^4 \times [C e^{-P_T T} S_c^c (P_T - P_1) + C_c (P_T^2 - 1) e^{\frac{-P_T T}{T_c}} \frac{S^u}{S^u(P_1)}]$$

$$D_S : 660 g_{PS} \frac{C_S C_C}{P_0} \int \int \frac{dP_1 dP_2}{P_1 P_2} P_1 e^{-P_1/T_S} P_2 e^{-P_2/T_C} \left(\frac{P_1}{P}\right)^3 \left(\frac{P_2}{P}\right)^{10} \delta(P_1 + P_2)$$

$$1+a=3$$

$$1+b=10$$

$$\frac{1}{B(3,10)} = 660$$

$$TT = \frac{660 g_{DS} C_S C_C}{P_0 P_T^{13}} \int_0^{P_T} dP_1 P_1 e^{-P_1/T_S} (P_T - P_1) e^{-(P_T - P_1)/T_C} \frac{P_1^2}{P_1^2 (P_T - P_1)^9}$$

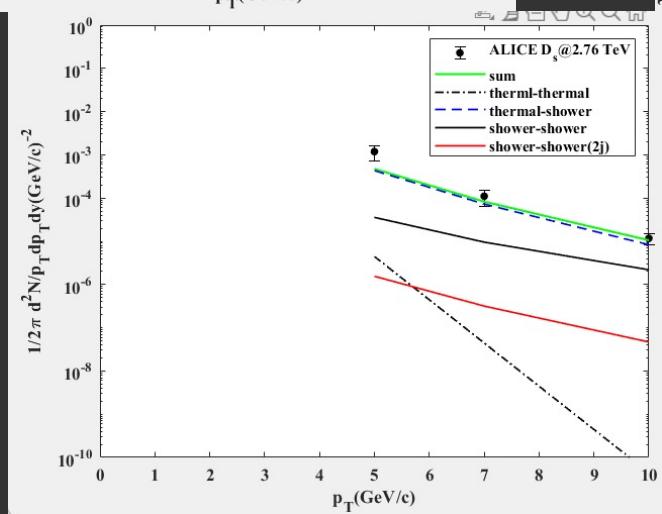
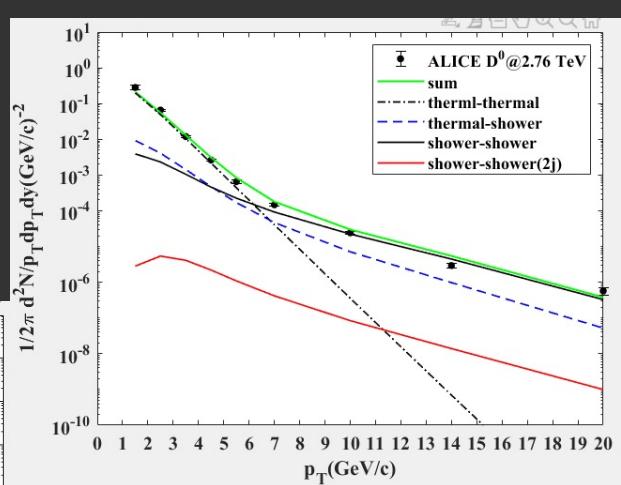
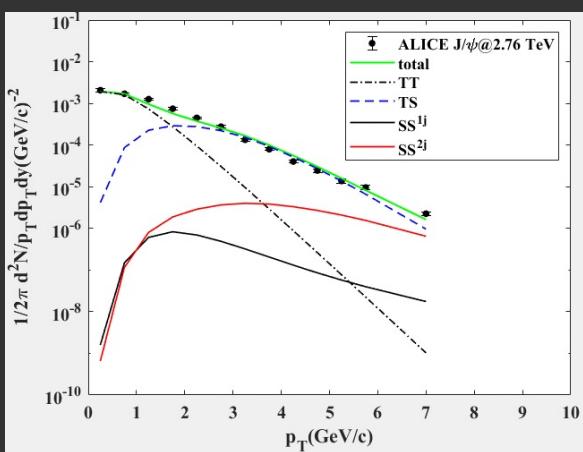
$$TS = \frac{660 g_{DS}}{P_0 P_T^{13}} \int_0^{P_T} dP_1 P_1^3 (P_T - P_1)^9 \\ \times [C_S e^{-P_1/T_S} S^C (P_T - P_1) + C_C \left(\frac{P_T}{P_1} - 1\right) e^{-\frac{(P_T - P_1)}{T_C}} S^C (P_1)]$$

2.76 TeV : $C_g = 23.2$ $T_g = 0.3 P$ $\gamma_0 = 2.8$
 $C_S = 11.0$ $T_S = 0.51$ $g = 7$

5.02 TeV : $C_g = 22.0$ $T_g = 0.42$ (0.415)

$C_S = 10.0$ $T_S = 0.545$

$\gamma_0 = 4.5$
 $g = 7$



From J/ψ : $T_c = 0.3$, $C_c = 0.5$



$$\gamma_0 = 1.7 , q = 0.8$$

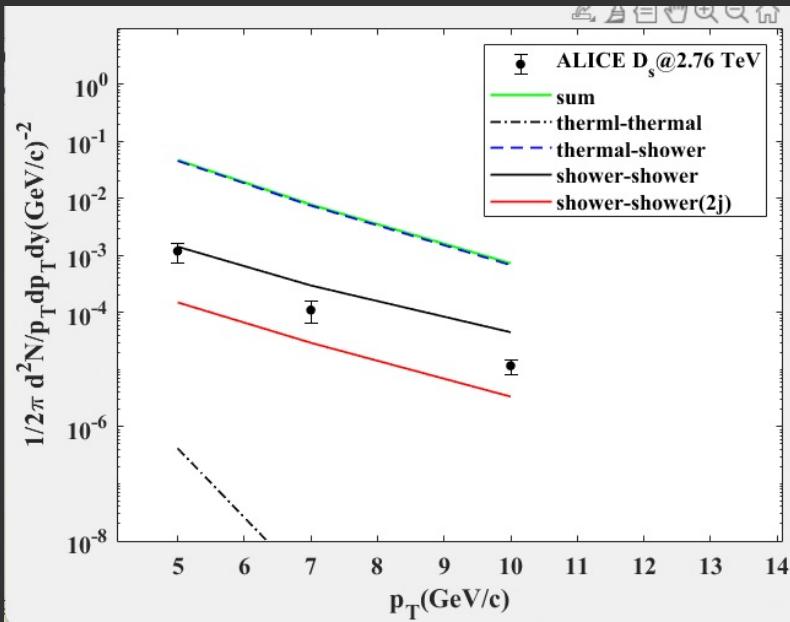
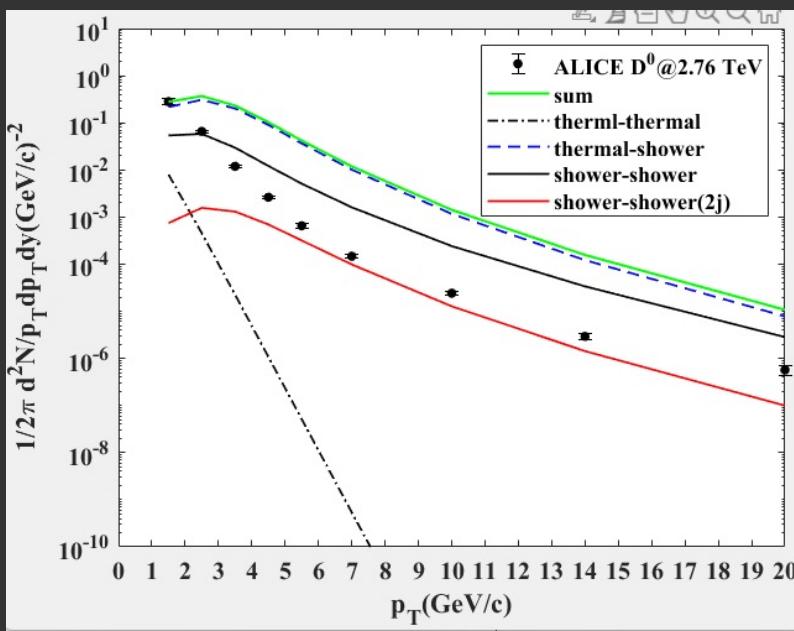
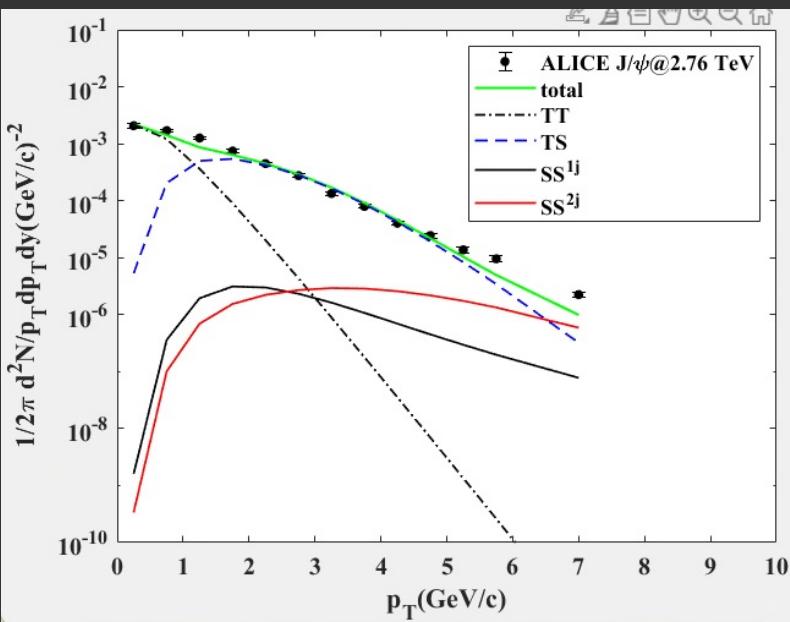
From D⁰ : $T_c = 0.3$, $C_c = 16.0$



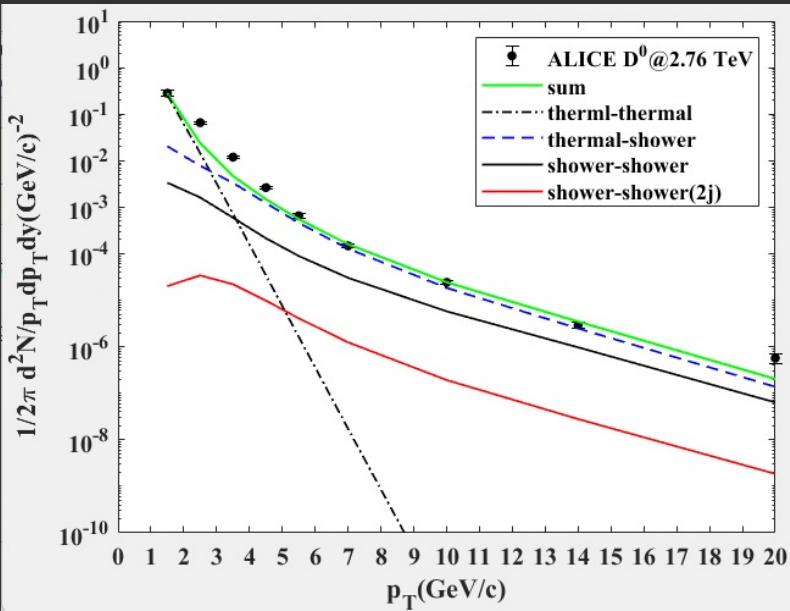
$$\left\{ \begin{array}{ll} \gamma_0 (0.5 \sim 4.5) & 1.7 \\ q_0 (1.0 \sim 11.0) & 11.0 \\ 1.7 \\ 10.8 \sim 12.8 \rightarrow 10.8 \end{array} \right.$$

$$C_c = 0.5, \quad T_c = 0.3, \quad \gamma_0 = 1.7, \quad g_0 = 0.8$$

fit from J/ψ



$$c_c = 16.0, T_c = 0.3, \gamma = 1.7, q_0 = 10.8$$



fit from D^0

