# 加载必要的包

library(ggplot2)

library(readxl) # 读取Excel文件

library(patchwork) # 组合图形

# 读入数据

data1 <- read\_excel("data\_2.xlsx", sheet = 1)

data2 <- read\_excel("data\_2.xlsx", sheet = 2)

data3 <- read\_excel("data\_2.xlsx", sheet = 3)

data4 <- read\_excel("data\_2.xlsx", sheet = 4)

# 图1-S1BF变量

p1 <- ggplot(data1, aes(x = `Time (s)`)) +

# 误差带

geom\_ribbon(aes(ymin = S1BF - SD, ymax = S1BF + SD), fill = "#dc96f0") + # 误差带上下边界（均值±标准误）

# 均值线

geom\_line(aes(y = S1BF, color = "S1BF"), linewidth = 0.7) + # 设置图例标签为"S1BF"

# 设置颜色

scale\_color\_manual(values = "#7813f3") + # 自定义线条颜色

# 调整坐标轴：固定坐标范围并设置刻度

scale\_x\_continuous(limits = c(-10, 20), # x轴范围从-10到20

breaks = seq(-10, 20, by = 5), # 每5个单位显示一个刻度

expand = c(0, 0)) + # 坐标轴两端不扩展

scale\_y\_continuous(limits = c(3.75, 4.0),

breaks = seq(3.8, 4.0, by = 0.1),

expand = c(0, 0)) +

# Y轴名称

labs(y = expression(F[570]\*"/"\*F[595]~"Ratio")) + # 带下标的标签

# 设置主题

theme\_classic()

print(p1)

# 图2-CA1变量

p2 <- ggplot(data2, aes(x = `Time (s)`)) +

geom\_ribbon(aes(ymin = CA1 - SD, ymax = CA1 + SD), fill = "#9fd4fa") +

geom\_line(aes(y = CA1, color = "CA1"), linewidth = 0.7) +

scale\_color\_manual(values = "#1562d4") +

scale\_x\_continuous(limits = c(-10, 20),

breaks = seq(-10, 20, by = 5),

expand = c(0, 0))+

scale\_y\_continuous(limits = c(3.4, 3.9),

breaks = seq(3.4, 3.9, by = 0.2),

expand = c(0, 0)) +

labs(y = NULL) +

theme\_classic()

print(p2)

# 图3-LD变量

p3 <- ggplot(data3, aes(x = `Time (s)`)) +

geom\_ribbon(aes(ymin = LD - SD, ymax = LD + SD), fill = "#b0e1b7") +

geom\_line(aes(y = LD, color = "LD"), linewidth = 0.7) +

scale\_color\_manual(values = "#1fa80c") +

scale\_x\_continuous(limits = c(-10, 20),

breaks = seq(-10, 20, by = 5),

expand = c(0, 0))+

scale\_y\_continuous(limits = c(3.3, 3.9),