function dates(yer, mon, day, hor) {

var date = ee.Date.fromYMD(yer, mon, day).advance(hor, 'hour');

var dst = date.millis().divide(1000 \* 3600 \* 24).add(719529);

return dst;

}

function dayornight(A, B1, B2) {

var c2 = ee.Image(0).where(A.gt(B1).and(A.lte(B2)), 1);

var c1=ee.Image(0);

c1 = c1.where(c2.eq(1), 1).where(c2.eq(0), 0);

return [c1];

}

function mysun(lon,lat,alt,tz,dte) {

var n = dte.subtract(dates(2000, 1, 1, 12)).add(68.184 / 86400);

var geometry = lon.geometry();

var Js = ee.Image(n).subtract(lon.divide(360));

var M = ee.Image(357.5291).add(ee.Image(0.98560028).multiply(Js)).mod(360);

M = M.toFloat();

var radM = M.multiply(Math.PI / 180);

var C = ee.Image(1).expression(

"1.9148 \* sin(A) + 0.0200 \* sin(2\*A) + 0.0003 \* sin(3\*A)",

{

"A": radM

}

);

C = C.toFloat();

var lambda = M.add(C).add(180).add(102.9372).mod(360);

var radLambda = lambda.multiply(Math.PI / 180);

// Solar transit

var Jt = ee.Image(1).expression(

"2451545.5 + A + 0.0053 \* sin(B) - 0.0069 \* sin(2\*C)",

{

"A": Js,

"B": radM,

"C": radLambda

}

);

var radtiltAngle = ee.Number(23.44).multiply(Math.PI / 180);

var delta = ee.Image(1).expression(

"asin(sin(A) \* sin(B))",

{

"A": radLambda,

"B": radtiltAngle

}

);

var radAlt = alt;

var radLat = lat.multiply(Math.PI / 180);

var radDelta =delta;

var radAltZero = radAlt.where(radAlt.lt(0), 0);

var ha = ee.Image(1).expression(

"((sin((-0.83 - 2.076 \* sqrt(A) / 60)\*3.141592654/180) - sin(B) \* sin(C)) / (cos(B) \* cos(C)))",

{

"A": radAltZero,

"B": radLat,

"C": radDelta

}

);

var omegaRad = ha.acos();

var omega = omegaRad.multiply(180 / Math.PI);

omega = omega.where(ha.lt(-1), 180);

omega = omega.where(ha.gt(1), 0);

var noon=Jt.add(dates(2000, 1, 1, 12)).subtract(ee.Image(2451545));

var sset = noon.add(omega.divide(360));

var srise = noon.subtract(omega.divide(360));

return [srise,sset];

}

var dataset = ee.Image('USGS/GMTED2010');

var elevation = dataset.select('be75');

var dataset= ee.Image ('ECMWF/ERA5/HOURLY').select('total\_precipitation\_hourly');

var lon\_grid = ee.Image.pixelLonLat().select('longitude');

var lat\_grid = ee.Image.pixelLonLat().select('latitude');

var lon = lon\_grid;

var lat = lat\_grid;

var alt=elevation;

var tz=0;

/\*var i=1981;

var j=5;\*/

/\*for (var i = 1; i <= 2021; i++) {\*/

/\*for (var i = 2001; i <= 2010; i++) {\*/

/\*for (var i = 2011; i <= 2022; i++) {\*/

for (var i = 1981; i <= 1995; i++) {

for (var j = 1; j <= 12; j++) {

var startDate = new Date(i, j - 1, 1);

var endDate = new Date(i, j, 0);

var daysInMonth = endDate.getDate();

var day\_len\_mat = ee.Image.constant(0).float();

var day\_pre\_mat=ee.Image.constant(0).float();

var night\_pre\_mat=ee.Image.constant(0).float();

for (var k = 1; k <= daysInMonth; k++) {

var dte= dates(i, j, k, 0).floor();

var result\_sun=mysun(lon,lat,alt,tz,dte);

var srise=result\_sun[0];

var sset=result\_sun[1];

for (var h = 0; h <= 23; h++) {

var tim\_mat= ee.Image(dates(i, j, k, h));

var c1=dayornight(tim\_mat, srise, sset);

var c2=c1[0];

var c3=ee.Image(1).subtract(c2);

var day\_len\_mat=day\_len\_mat.add(c2);

var strday = i + '-' + j + '-' + k;

if (k == daysInMonth && j == 12) {

var inex=i+1;

var endday = inex + '-01-01';

} else if (k == daysInMonth && j != 12) {

var jnex= j+1;

var endday = i + '-' + jnex + '-01';

} else {

var knex=k+1;

var endday = i + '-' + j + '-' + knex;

}

var pre\_fd1 = ee.ImageCollection('ECMWF/ERA5\_LAND/HOURLY')

.select('total\_precipitation\_hourly')

.filterDate(strday,endday)

.filter(ee.Filter.eq('hour', h));

var pre\_fd2=pre\_fd1.first();

/\* print(pre\_fd2);\*/

/\* print('pre\_fd2',pre\_fd2); \*/

var pre\_fd3=pre\_fd2.multiply(c2);

var pre\_fn3=pre\_fd2.multiply(c3);

var day\_pre\_mat=day\_pre\_mat.add(pre\_fd3);

var night\_pre\_mat=night\_pre\_mat.add(pre\_fn3);

}

}

var str\_day = i+'-'+j+'-'+k;

var year = i;

var month = j;

var year\_str = ('0000' + year.toString()).slice(-4);

var month\_str = ('00' + month.toString()).slice(-2);

var date = ee.Date.fromYMD(year, month, 1);

var date\_str = date.format('YYYYMM');

var strday=date\_str.getInfo(); // 输出：my\_file\_2022-05-11

/\* Export.image.toDrive({

image: day\_pre\_mat,

description: strday,

fileNamePrefix: strday,

folder: 'day\_pre',

scale: 55000,

crs: "EPSG:4326",

maxPixels: 1e13\*/

Export.image.toDrive({

image: night\_pre\_mat,

description: strday,

fileNamePrefix: strday,

folder: 'night\_pre',

scale: 55000,

crs: "EPSG:4326",

maxPixels: 1e13

});

}

}