

座標軸の描画

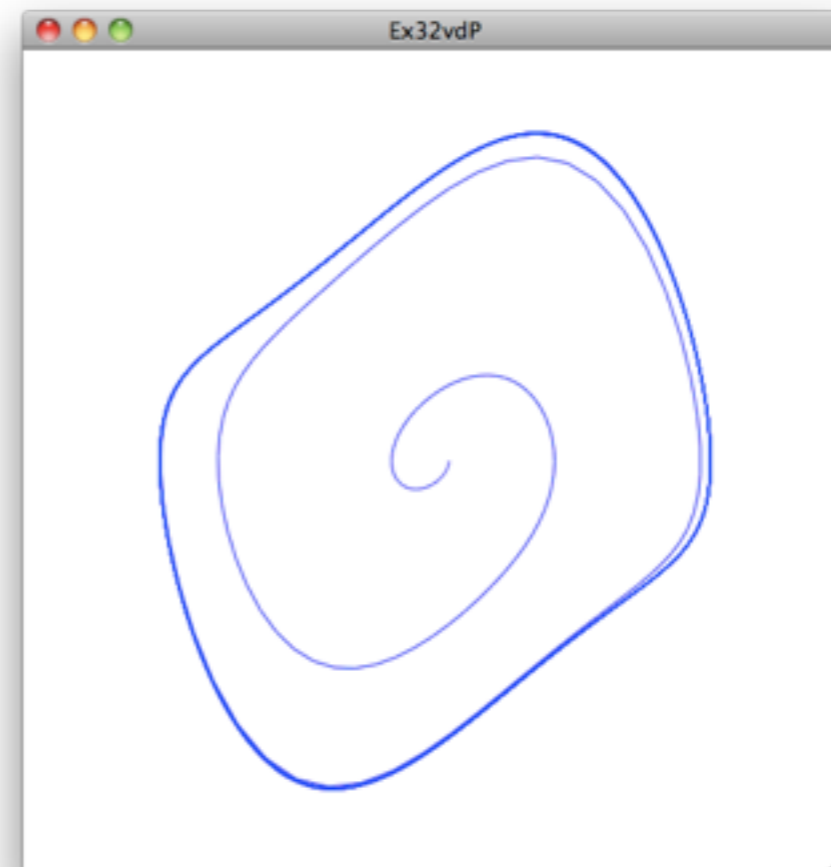
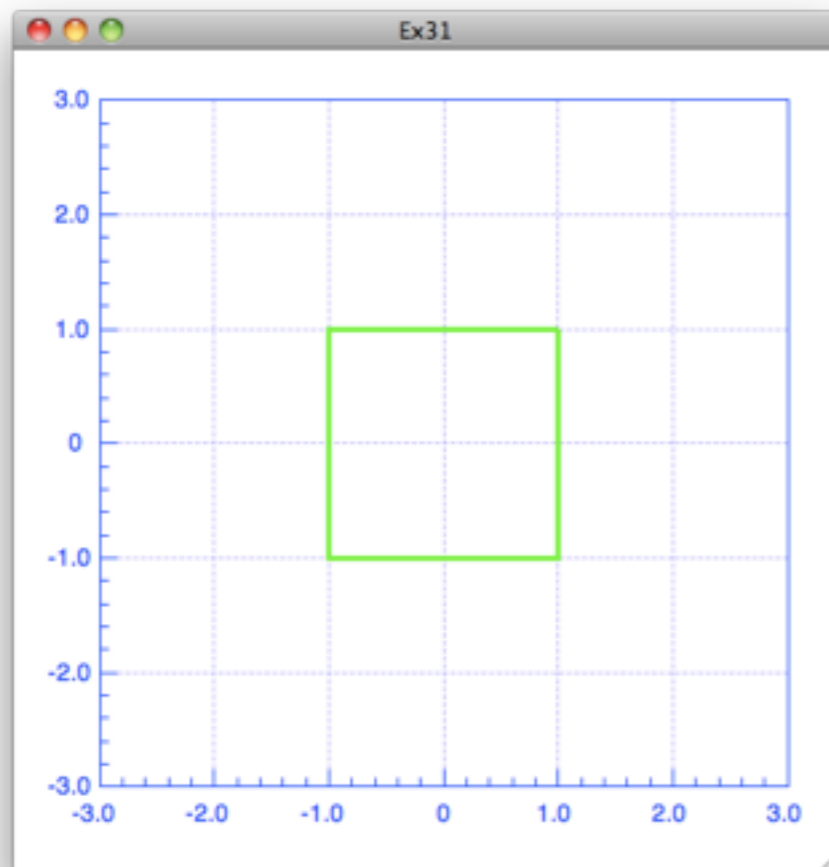
— Cの関数とObj-Cのクラスをまぜて使う —

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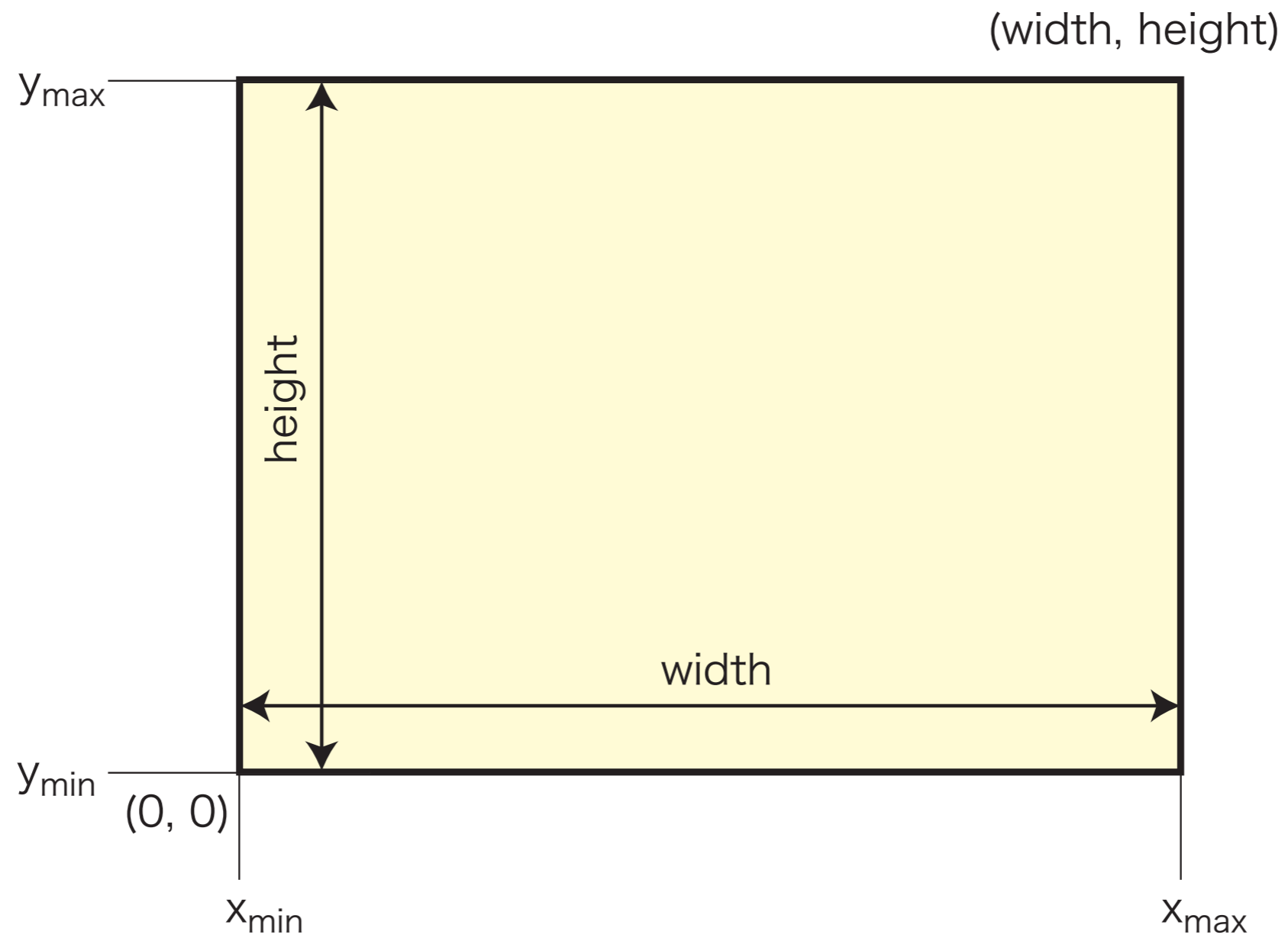
April, 2010(H22)

今日のプログラム

- (1) 座標軸を表示するプログラムをつくる：Ex31
- (2) 初期値を与え，軌道を描くプログラム:Ex32vdP



座標変換その1



座標変換その1

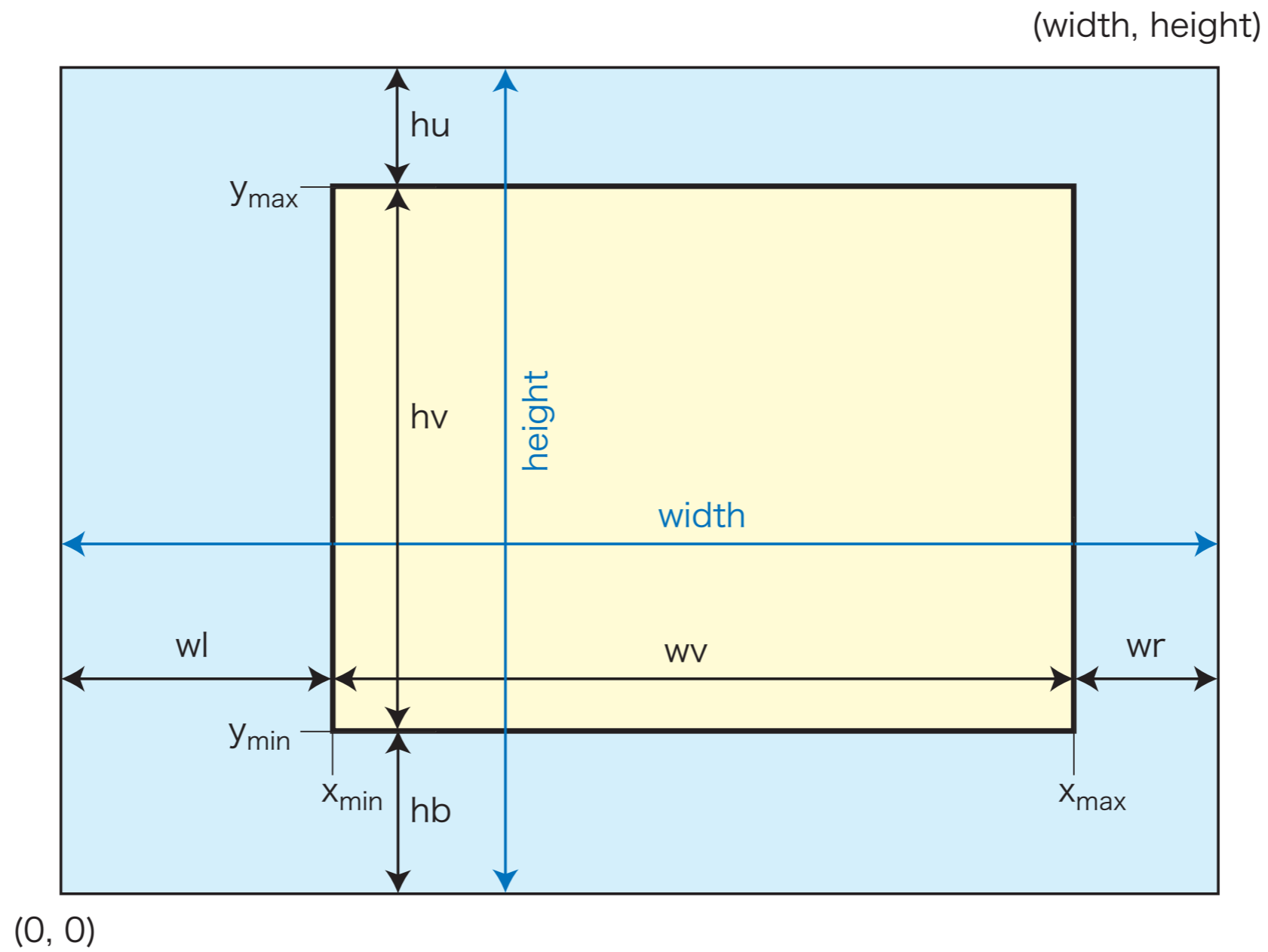
$$u = \frac{width}{x_{max} - x_{min}} (x - x_{min})$$

$$v = \frac{height}{y_{max} - y_{min}} (y - y_{min})$$

$$x = \frac{x_{max} - x_{min}}{width} u + x_{min}$$

$$y = \frac{y_{max} - y_{min}}{height} v + y_{min}$$

座標変換その2



座標変換その2

$$u = \frac{width - (w_\ell + w_r)}{x_{max} - x_{min}} (x - x_{min}) + w_\ell$$

$$v = \frac{height - (h_b + h_u)}{y_{max} - y_{min}} (y - y_{min}) + h_b$$

$$x = \frac{x_{max} - x_{min}}{width - (w_\ell + w_r)} (u - w_\ell) + x_{min}$$

$$y = \frac{y_{max} - y_{min}}{height - (h_b + h_u)} (v - h_b) + y_{min}$$

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NSBezierPath *oval;
double x[2], x1[2], xm[2], ym[2], u[2], alpha[2], p[2];

@implementation MyView
- (id)initWithFrame:(NSRect)frameRect{
    if ((self = [super initWithFrame:frameRect]) != nil){
        xm[0]=-3.0; xm[1]=3.0; ym[0]=-3.0; ym[1]=3.0;
        x[0]=0.1; x[1]=0.0;
        p[0]=0.5; p[1]=0.8;
    }
    return self;
}
- (void)drawRect:(NSRect)rect{
    double a[2],y[2];
    int i;

    [[NSColor whiteColor] set];
    NSRectFill(rect);

    [[NSColor blueColor] set];
    oval = [NSBezierPath bezierPath];
    alpha[0] = rect.size.width/(xm[1]-xm[0]);
    alpha[1] = rect.size.height/(ym[1]-ym[0]);
    for(i=0; i<300; i++){
        y[0]=x[0]; y[1]=x[1];

        a[0]=alpha[0]*(y[0]-xm[0]);
        a[1]=alpha[1]*(y[1]-ym[0]);

        runge(2,0.1,x,0.0);

        u[0]=alpha[0]*(x[0]-xm[0]);
        u[1]=alpha[1]*(x[1]-ym[0]);

        [oval moveToPoint:NSMakePoint(a[0],a[1])];
        [oval lineToPoint:NSMakePoint(u[0],u[1])];
    }
    [oval stroke];
}
@end

```

The Half-Pixel Line Problem

