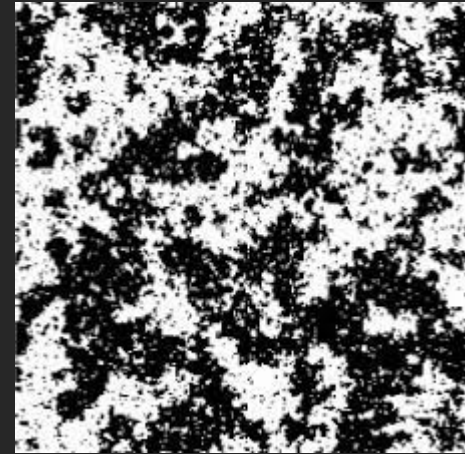


Funciones respuesta
y análisis de
configuraciones



20 de Mayo de 2021

Pseudo-código para Ising

```
poblamos_red();

loop sobre temperaturas
{
    creo_tabla();
    calculo_E_inicial();
    calculo_M_inicial();

    termalizacion();

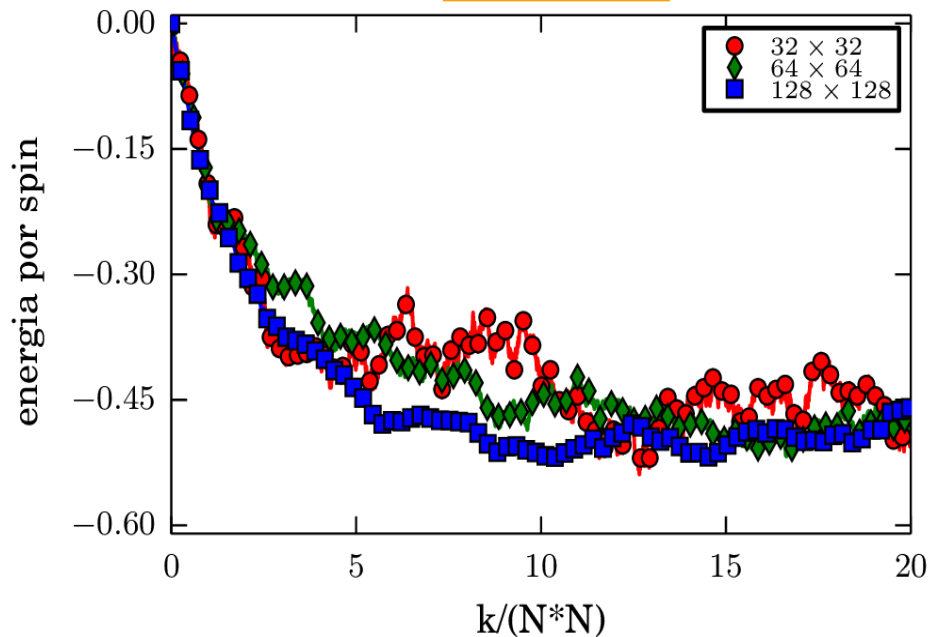
    loop sobre mediciones
    {
        loop sobre pasos de metropolis
        {
            metropolis();
        }
        vec_e[s] = energ;
        vec_m[s] = m;
    }
}
```

Me “aseguro” que estoy a esa temperatura (hay que averiguar cuantos pasos hacer)

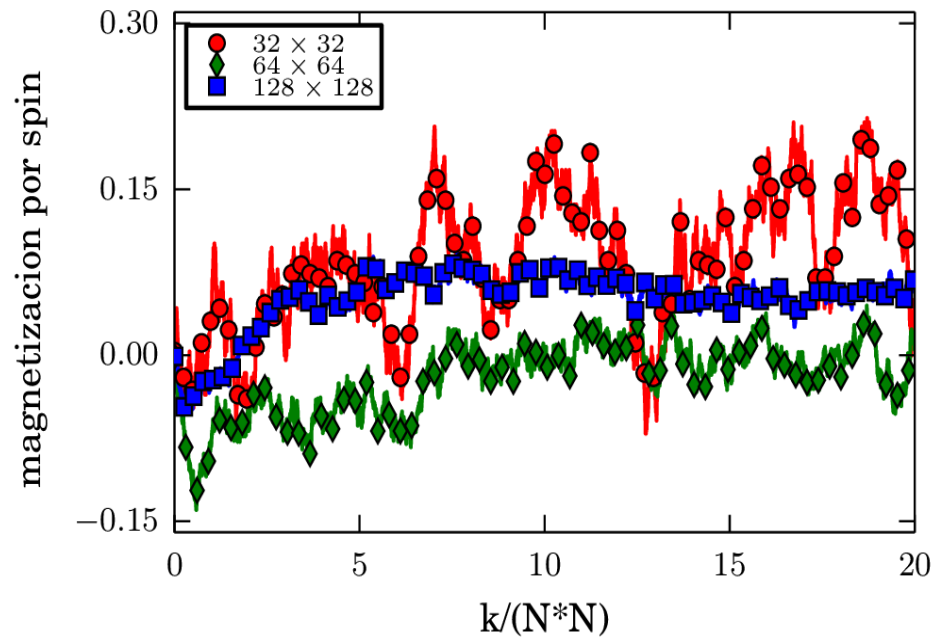
Para descorrelacionar las mediciones (hay que averiguar cuantos pasos hacer)

Termalización del sistema a $T=5$, $j=1$ y $B=0$

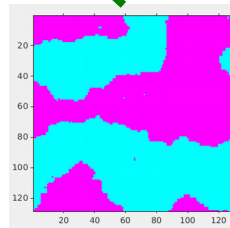
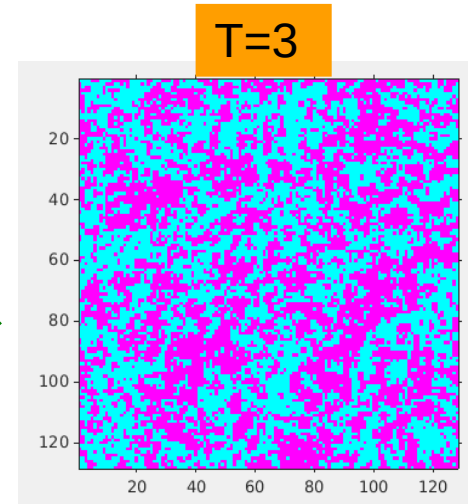
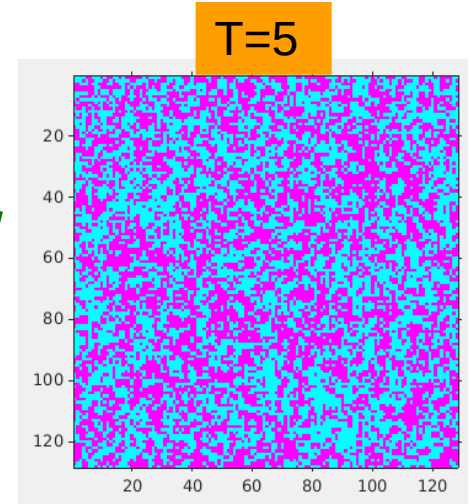
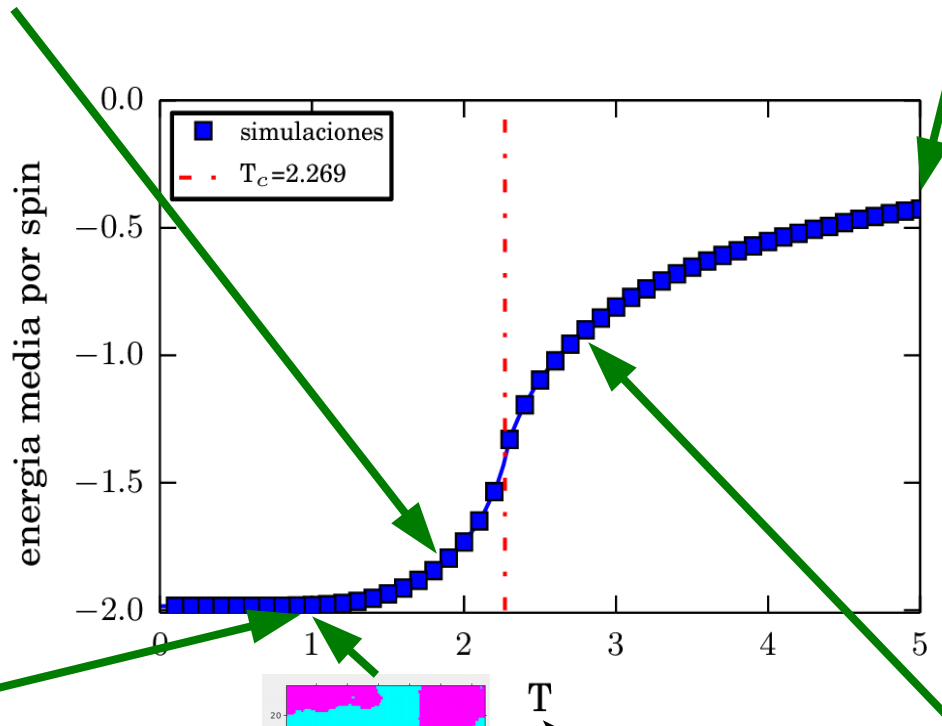
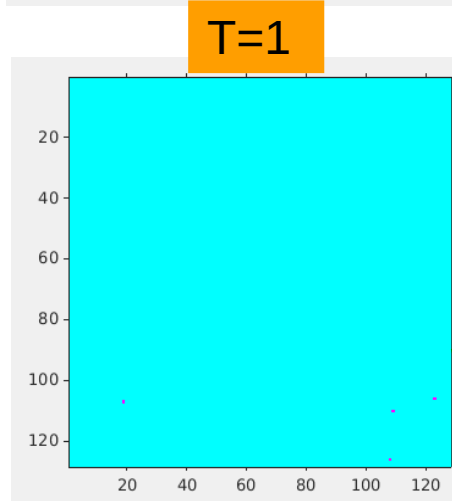
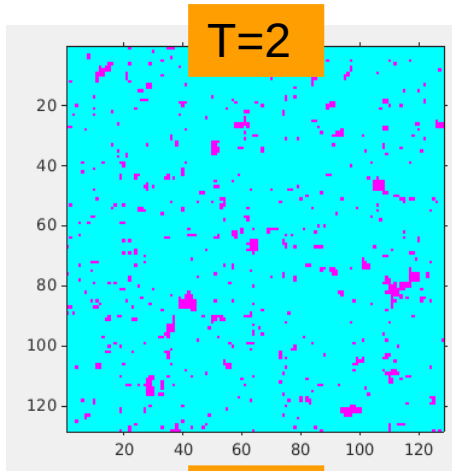
Energía



Magnetización



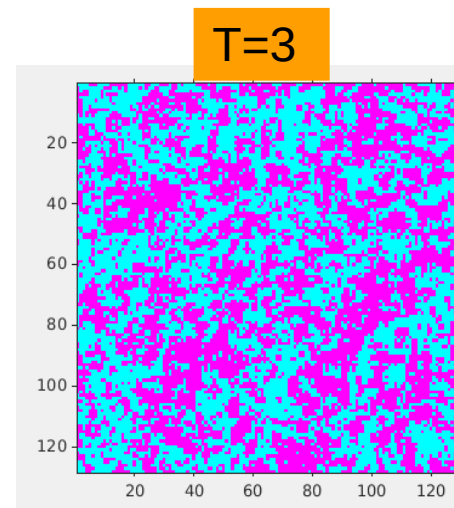
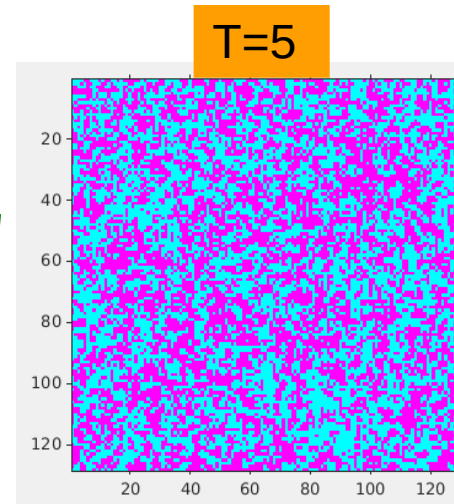
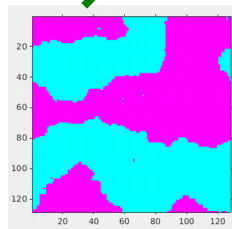
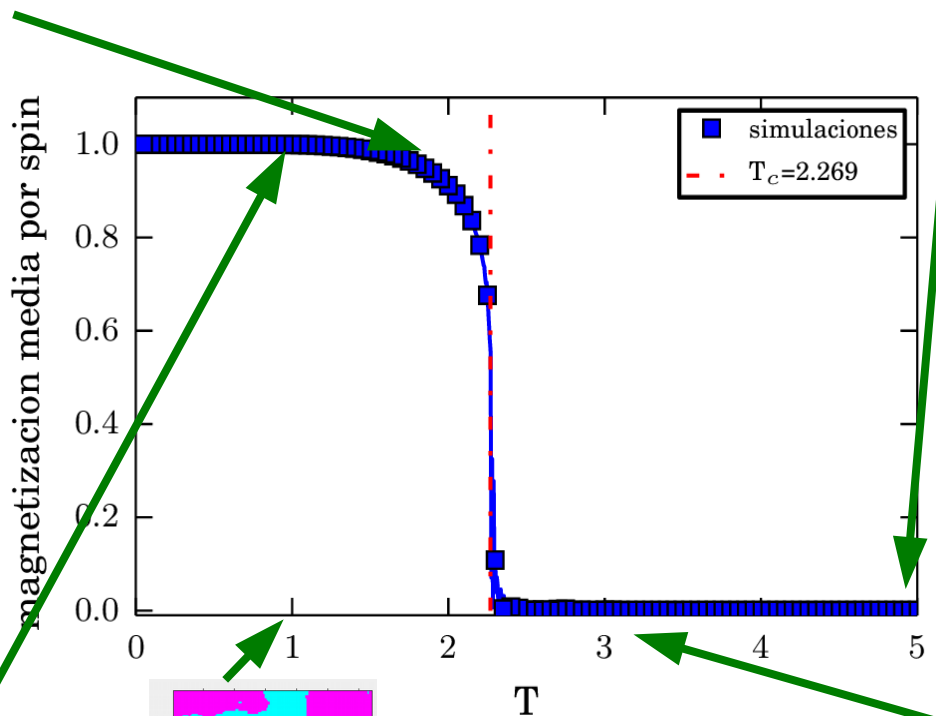
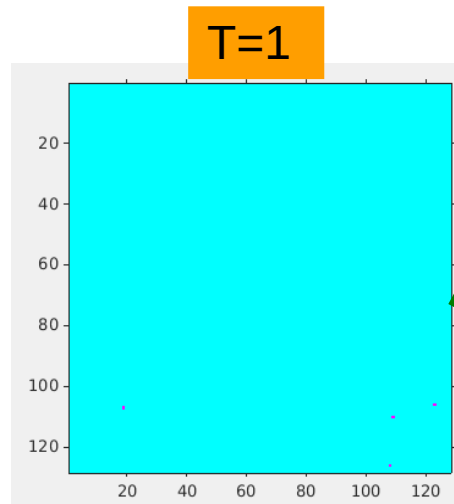
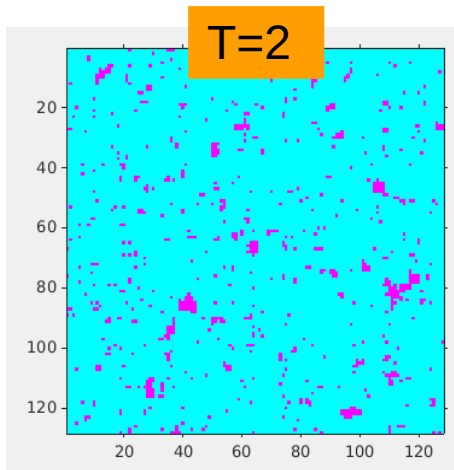
Energía media del sistema (128x128, j=1, B=0)



T

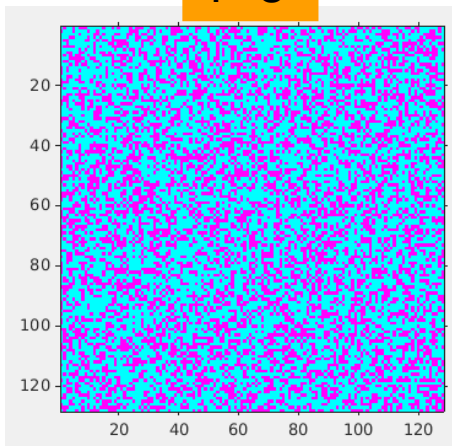
A veces se grafica T/T_c

Magnetización media del sistema (128x128, $j=1$, $B=0$)

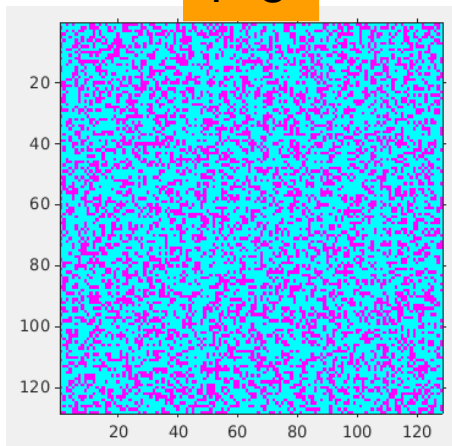


$B=1, j=0$

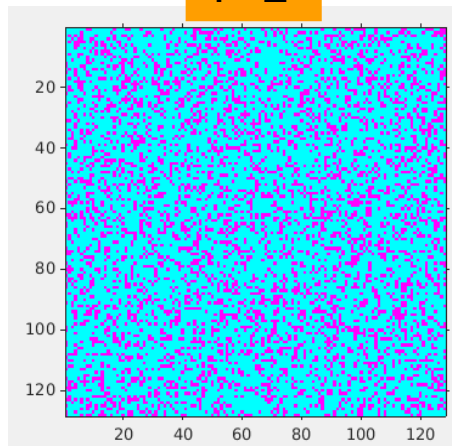
T=5



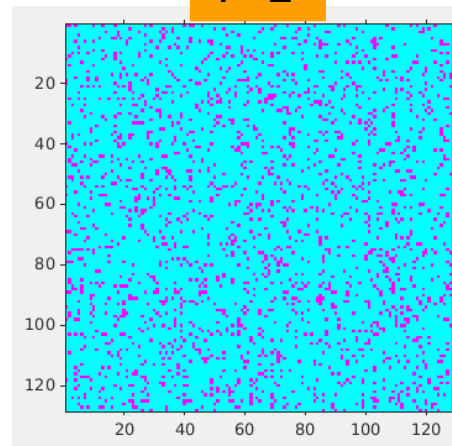
T=3



T=2

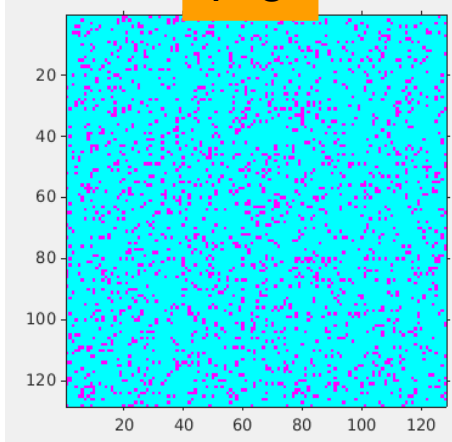


T=1

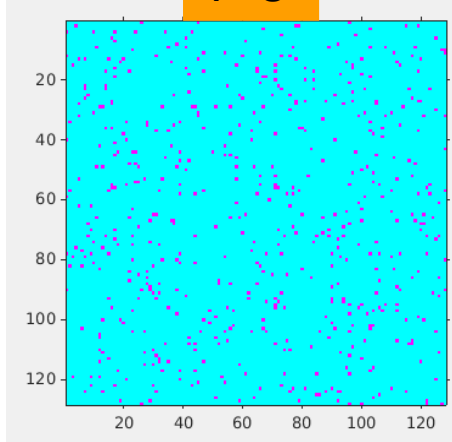


$B=5, j=0$

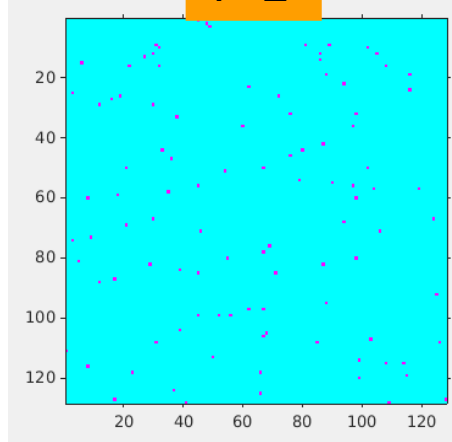
T=5



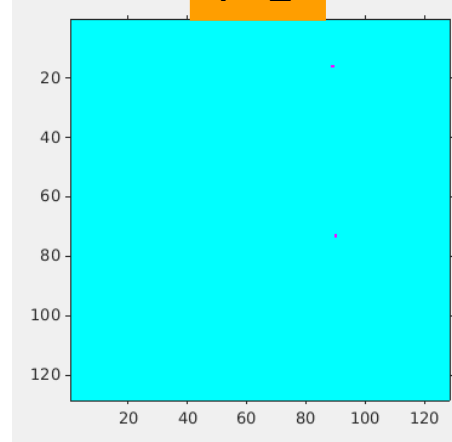
T=3



T=2



T=1



Calor específico y susceptibilidad magnética

$$c_v = k_B \beta^2 (\langle E^2 \rangle - \langle E \rangle^2)$$
$$\chi_M = \beta (\langle M^2 \rangle - \langle M \rangle^2)$$

¿Cómo responde nuestro sistema ante un cambio de temperatura ó de campo magnético?

```
poblamos_red();

loop sobre temperaturas
{
    creo_tabla();
    calculo_E_inicial();
    calculo_M_inicial();

    termalizacion();

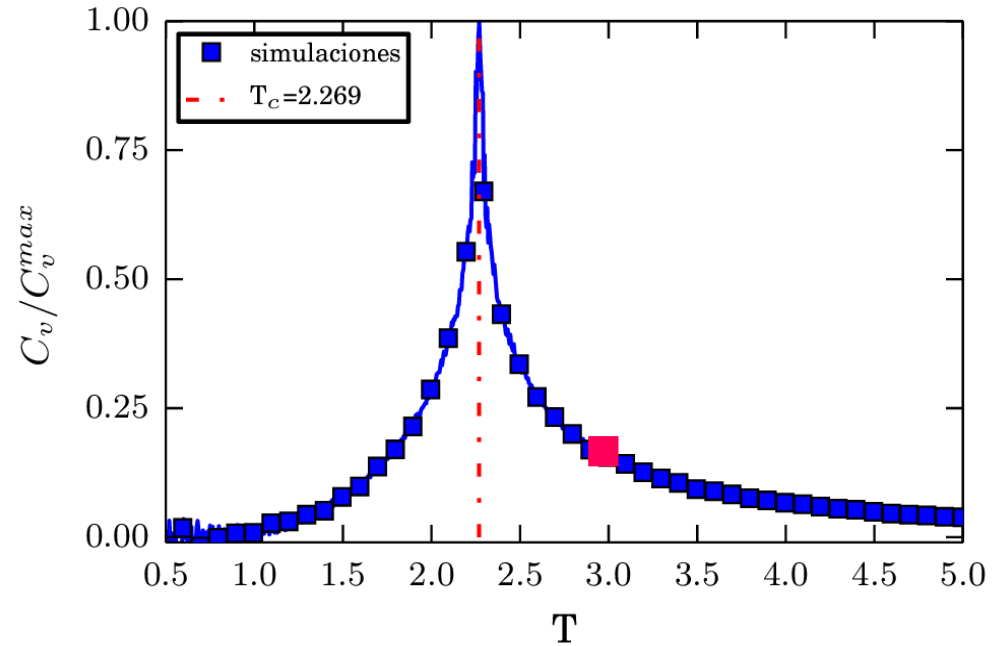
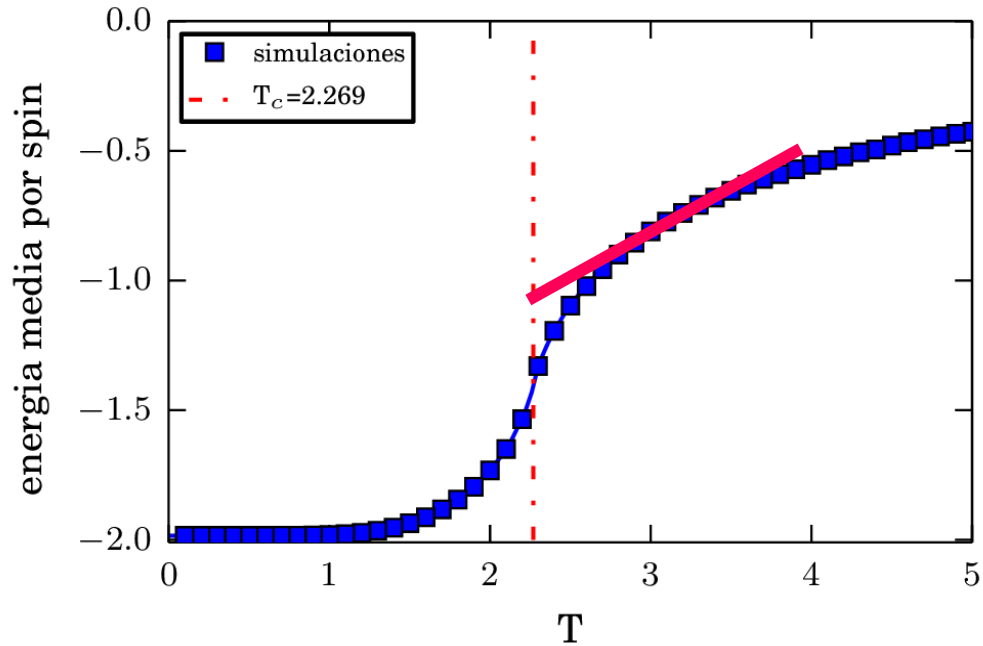
    loop sobre mediciones
    {
        loop sobre pasos de metropolis
        {
            metropolis();
        }
        vec_e[s] = energ;
        vec_m[s] = m;
    }
}
```

Calor específico para $j=1$ y $B=0$

$$c_v = k_B \beta^2 (\langle E^2 \rangle - \langle E \rangle^2)$$

$$c(T, 0) \propto |T - T_c|^{-\alpha} \quad \text{for } T \rightarrow T_c.$$

(2.42)



Susceptibilidad magnética para $j=1$ y $B=0$

$$\chi(T, 0) \propto |T - T_c|^{-\gamma} \quad \text{for } T \rightarrow T_c, \quad (2.41)$$

$$\chi_M = \beta(\langle M^2 \rangle - \langle M \rangle^2)$$

