

# Forced Monotone Methods

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**Abstract:** We consider a boundary value problem of the form

$$y''(t) = f(t, y(t), y'(t)), \quad a < t < b, \quad y(a) = A, y(b) = B, \quad (1)$$

where  $a < b$ ,  $f$  is continuous a continuous map and  $A$  and  $B$  are real. The method of upper and lower solutions, coupled with monotone methods, is useful if  $f$  is independent of  $y'$ . If the conjugate conditions,  $y(a) = A, y(b) = B$ , are replaced by right focal conditions  $y(a) = A, y'(b) = B$ , then the method of upper and lower solutions, coupled with monotone methods, is useful in the case that  $f$  depends on  $y$  and on  $y'$ . In this talk, we construct a boundary value problem of the form

$$y''(t) = f(t, y(t), y'(t)), \quad a < t < b, \quad y(a) = A, y(b) = g(y, y'),$$

which is equivalent to (1) and obtain seek sufficient conditions on  $f$  and on  $g$  such that the method of upper and lower solutions, coupled with monotone methods, is useful.